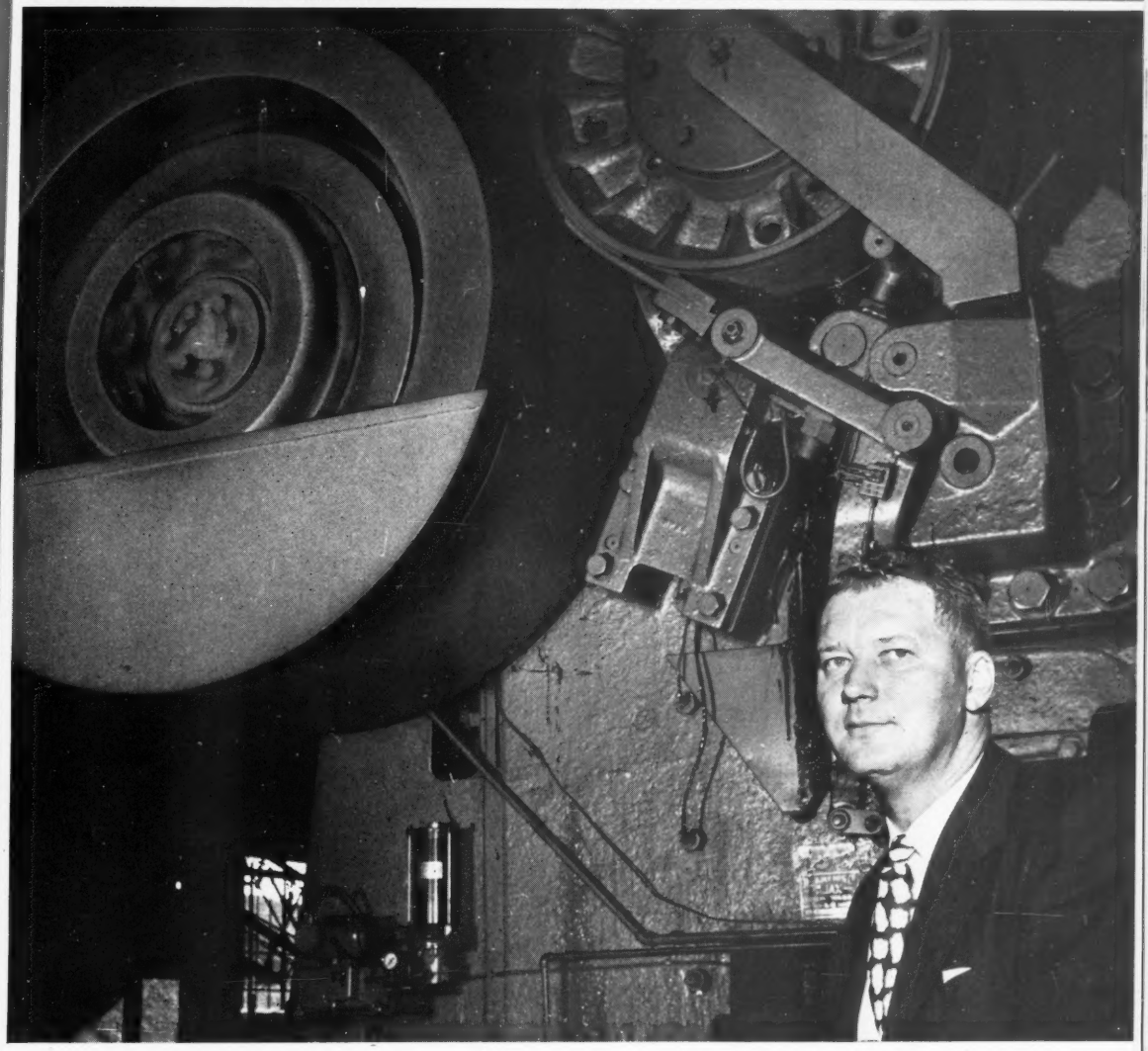
SEPTEMBER 29, 1952

Brown

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



Chrysler's modern blacksmith—A. L. Gostow

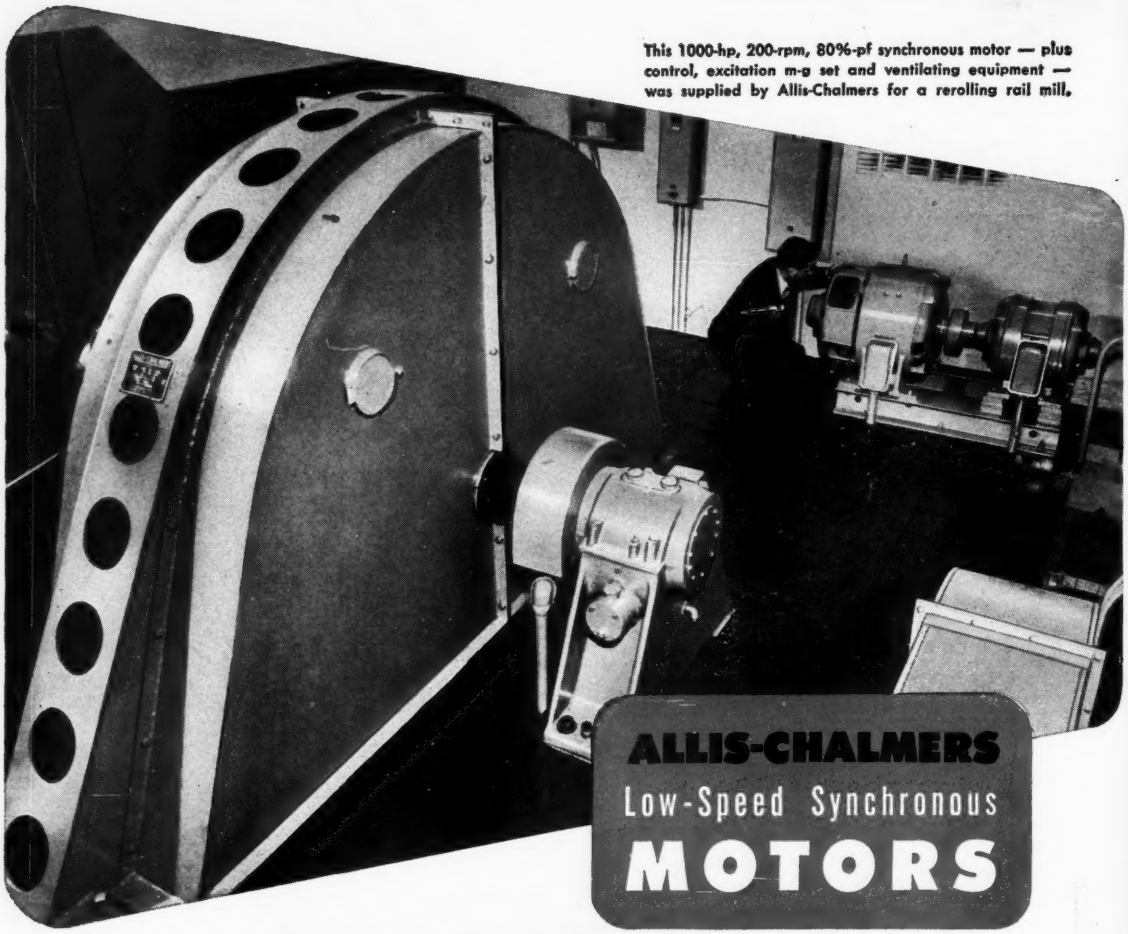
Continuous Crankshaft Forging

It takes a lot of capital to make a new idea work, page 78

✓ **WHAT'S AHEAD FOR COAL? p. 47**
Lewis' Wage Pact May Aid Gas, Oil

✓ **UNUSUAL FORMING TECHNIQUE, p. 76**
Explosive Pressing Does the Job

CONTENTS — PAGE 5



This 1000-hp, 200-rpm, 80%-pf synchronous motor — plus control, excitation m-g set and ventilating equipment — was supplied by Allis-Chalmers for a rerolling rail mill.

For Efficiency that's Contagious

SYNCHRONOUS MOTORS give you inherently high efficiency. But that's not all. Their capacity for power-factor correction offers the added bonus of more efficient utilization of your entire plant power system. This contagious efficiency of synchronous motors is especially pronounced in low-speed drives.

Applied to constant load drives, synchronous motors can correct the lagging kva from inductive apparatus. Applied to fluctuating loads, synchronous motors can still serve advantageously — by not adding to the power-factor burden on the system.

When you need low-speed motors, you can get this dual efficiency without paying any price premium. What's more, synchronous motors are available with high pull-out torques adequate for heavy-duty applications.

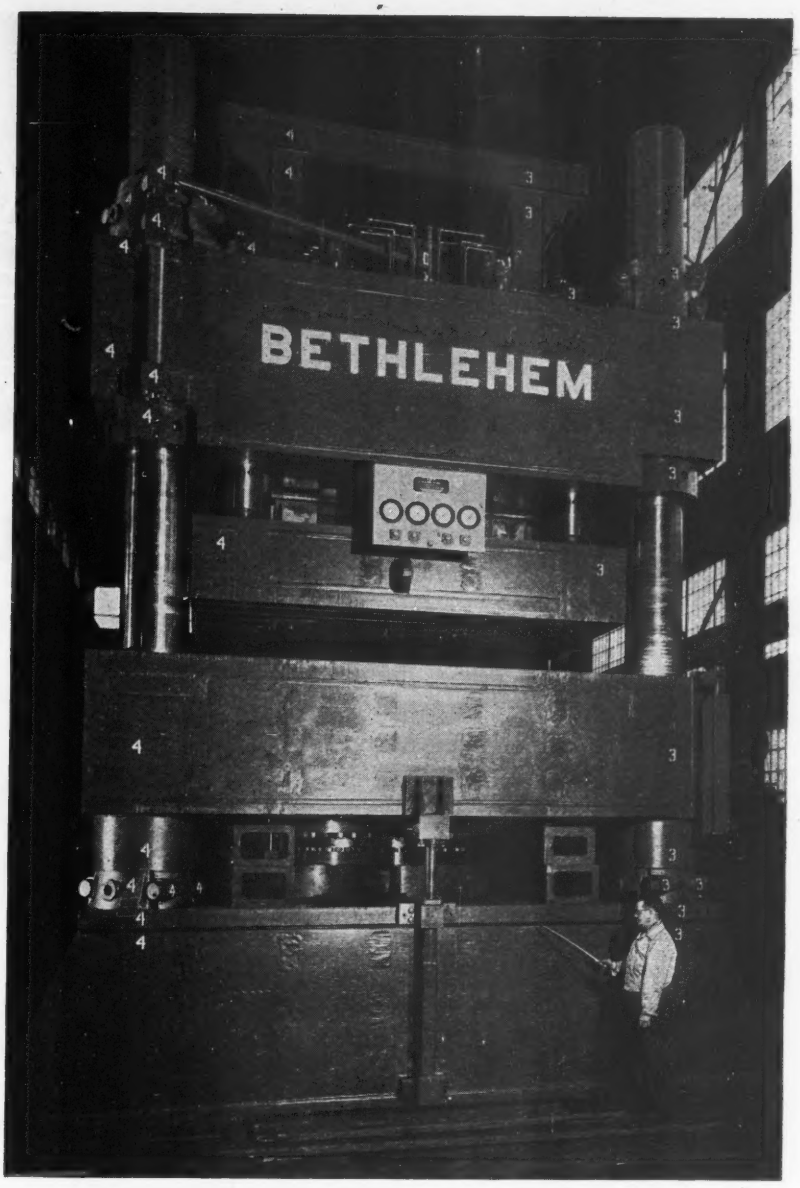
For more information about large, low-speed synchronous motors, ask your A-C representative for Bulletin 05B7648, or write Allis-Chalmers, Milwaukee 1, Wis.

A-3764

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

4000-ton forming press has 75% welded construction



This 4000-ton, hydraulic double-action forming press was built by Bethlehem for the Standard Railway Equipment Manufacturing Company. It has a 17 ft, 2 in. top platen, a 21-ft bottom platen, a 17 ft, 2 in. crosshead, and a 12-ft blankholder. Its total weight is 1,043,030 lb. About 75 pct of its construction involved the forming and welding of plate steel at Bethlehem's Weldment Shop.

In the construction of most any press, machine, or machine part, Bethlehem Weldments can be used to good advantage. For example:

Bethlehem Weldments are economical. They eliminate excess weight, without sacrificing rigidity. Their use frequently means a lower manufacturing cost for the finished product.

Bethlehem Weldments are versatile. They cover a size range so wide as to meet virtually every need. And they can be produced either as simple parts or intricate assemblies.

Bethlehem Weldments offer freedom of design. This is because the steel from which they are made can be bent, pressed or shaped prior to welding without harm to its physical structure. In addition, they can be combined effectively with forgings or castings.

There's every reason to believe that you will find Bethlehem Weldments to your liking. A Bethlehem representative would be glad to talk it over with you at your convenience. Just contact the nearest Bethlehem office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM WELDMENTS

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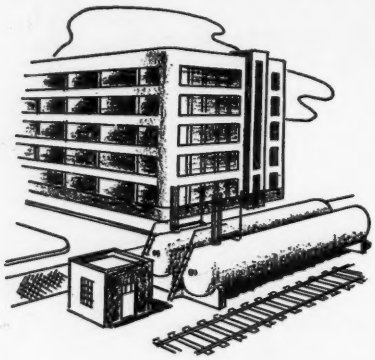
Phillips 66

Philgas*

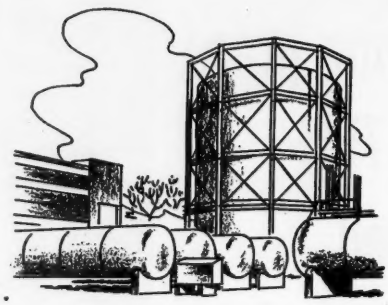
THE ALL-PURPOSE FUEL

For Industries



Philgas, a clean, high-quality LP-Gas, is being used by leading industries for heat treating, mold drying, core baking, ceramic firing and many other operations. Philgas butane-propane systems are automatic, cutting down on overhead while assuring constant furnace temperatures, atmospheres, and pressures.

For Utilities



Free from harmful contaminants, Philgas is used by many progressive utilities to augment supplies of natural or manufactured gas. Cleanliness, uniformity, constant pressures (high or low) and easy automatic operation make Philgas a *superior* product. It's America's largest selling brand of LP-Gas.

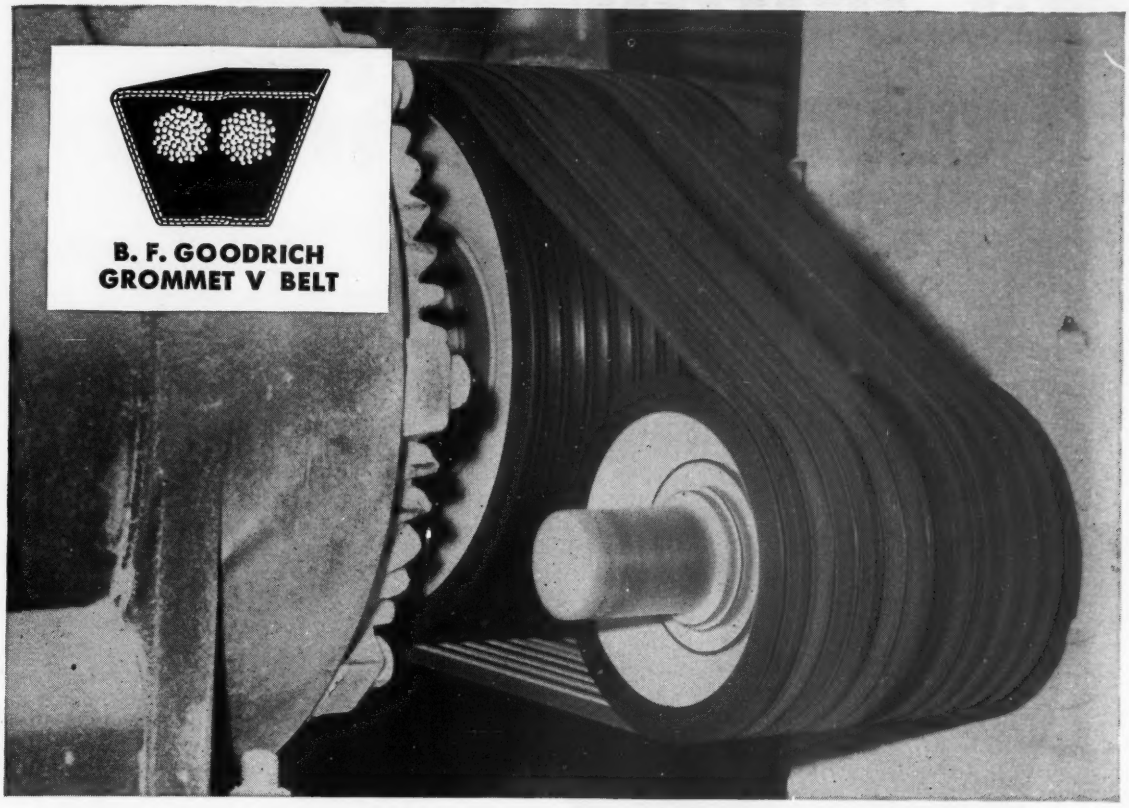
*Phillips *66* and Philgas are the Phillips Petroleum Company trademarks for its high quality propane-butane LP-Gas or bottled gas.

PHILLIPS PETROLEUM COMPANY

Sales Department — Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Pontiac, Mich., Indianapolis, Ind., Kansas City, Mo., Milwaukee, Wis., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tulsa, Okla., Wichita, Kan.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Where B.F.Goodrich grommet belts outlasted others 3 to 1

B. F. Goodrich grommet V belts cut costs 20 to 50%

ORDINARY belts, previously used on this drive, couldn't stand the heavy load, couldn't take the strain of 24-hour-a-day service. There were frequent shutdowns for repairs. Belts were averaging only 3 months' life. Then B. F. Goodrich grommet V belts were installed. When the picture was taken, the grommet belts had already outlasted ordinary belts 3 to 1, maintenance costs had been cut nearly 100%, and the belts still looked good for a lot more service. Here's why:

No cord ends — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

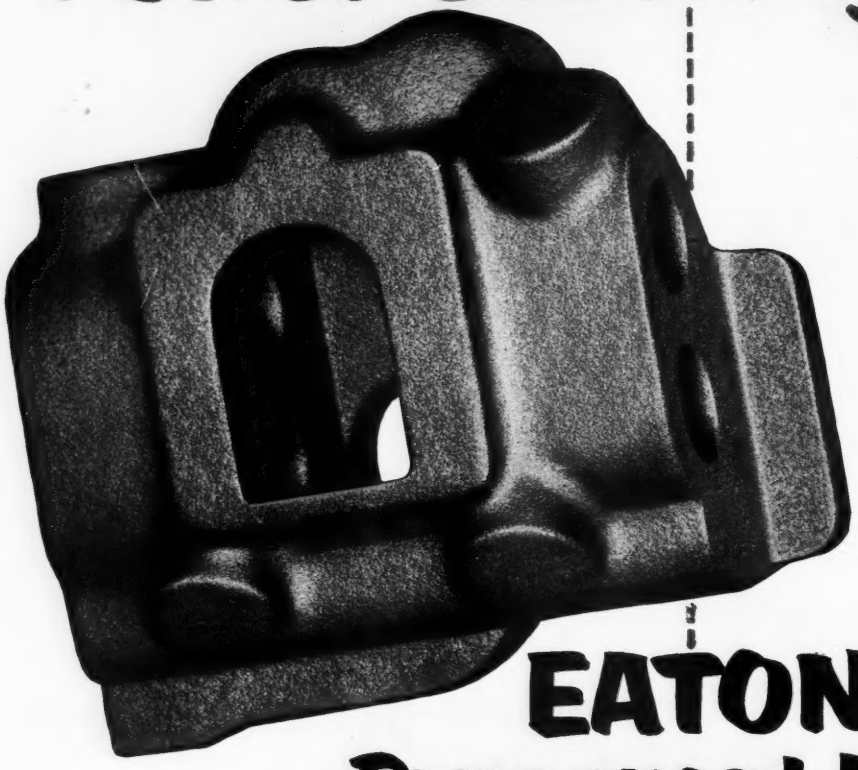
Concentrated cord strength — All of the cord material in a B. F. Goodrich grommet belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. There are no layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced. And grommet V belts stretch less — only ⅓ as much, on an average, as ordinary V belts.

Better grip, less slip — Grommet V belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

They cost no more — Grommet V belts cut costs because they last longer, increase production because machines keep running with fewer interruptions, reduce maintenance costs because they need less attention, yet they cost not one cent more. Available in C, D, and E sections. But remember, only B. F. Goodrich makes the grommet V belt (U. S. Patent No. 2,233,294), so to get all these savings, call in your local BFG distributor the next time you need V belts, or write *The B. F. Goodrich Company, Industrial & General Products Div., Akron, Ohio.* (Available in Canada)

Grommet V-Belts BY
B.F.Goodrich
FIRST IN RUBBER

For better Power Steering



EATON Permanent Mold Gray Iron Castings

Send for your copy of the illustrated booklet, "A Picture Tour of the Eaton Permanent Mold Foundry."

Free machinability
Dense, non-porous structure
Uniform structure throughout the casting
Freedom from leakage under pressure
Machines to high, mirror-like finish
Properly annealed; no growth or distortion after machining

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CLEVELAND, OHIO
FOUNDRY DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

This Week in Metalworking

STEEL

Vol. 131 No. 13 Sept. 29, 1952

√NEWS √PRODUCTION-ENGINEERING √MARKETS

√Metalworking Outlook 39
Selected condensed news items reflecting the possible future course of the metalworking world

As the Editor Views the News 43

Windows of Washington 54

Mirrors of Motordom 61
Detroit Editor H. C. Tuttle covers the automobile front as the deadline nears for that exciting event—new models

The Business Trend 65

Men of Industry 69

√Production-Engineering News at a Glance 75

Explosive Pressing Forms New Material 76
Using an old Army breech block and chamber they're blasting a new material, Kentanium, into being

New Forging Twist: Crankshaft Output Tripled 78
Continuous press forging of automotive crankshafts is completely mechanized at Dodge plant

Flame Plating: Wearing Parts Get Longer Lease on Life 82
New method puts undiluted deposit of tungsten carbide on almost any metal. Widens designers' horizon

Welded Girders Part of Huge Bridge Cranes 86
McNary Dam will have two 350-ton bridge cranes. Huge girders are largely seam welded

Progress in Steelmaking 94
Strip Width Held to Close Limits—Electronic eagle-eye tells on 1/64-inch variations. Scrap is minimized

New Products and Equipment 115

√The Market Outlook 139
Metal Prices and Composites start on Page 140

The Metal Market 151

Behind the Scenes	6	Obituaries	72
Letters to the Editors	10	Calendar of Meetings	109
Subcontract Summary	52	Helpful Literature	135
Checklist on Controls	53	Here, There in Metalworking	161

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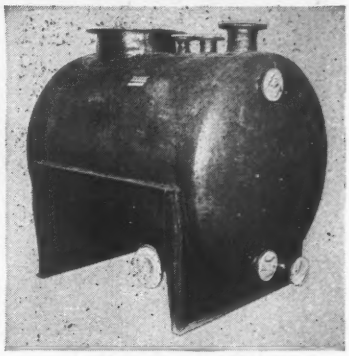
IMPORTANT USE for PLA-TANK®

Resin-Bonded Fiberglas® Material



Chemical and Laboratory Waste Treatment Tanks and Corrosion-Resistant Drain-Pipe

The 500-gal. tank shown here is part of such a system, holding corrosive liquid waste and aerating it during treatment before discharge.

PLA-TANK material is ideal for such uses. It is strong, yet light weight. Its thin wall section is molded into almost any shape. Connections may be integrally formed at any point. The chemical resistance of its polyester resin and Fiberglas is ideal for most waste disposal products. Deliveries are good, cost is competitive with or lower than other suitable materials.

In electro-plating shops or chemical plants where drain-pipe corrosion is a problem, PLA-TANK pipe from 2"-48" can help you.

Before you order any corrosion-resistant material for TANKS, DRAIN-PIPE, FUME DUCT or VENT HOODS, send us a sketch for free quotation and recommendations using PLA-TANK.

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Since 1909, the job of The Electric Products Company has been to create and develop special electrical rotating equipment . . . motors and generators to do existing jobs better or to reach into new fields to do jobs that couldn't be done before. The natural "by-product" of our more than 40 years of specialization is that you get equipment designed and built to the exact requirements of your application . . . equipment that has greater dependability, longer life and that requires less maintenance.

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X-74

Behind the Scenes...

Prof. Shrdlu Holds a Quiz

Here's another chance to test your industrial I.Q. Fill in the 15 blanks below in this column's semiannual quiz. All data relate to items in STEEL's issues of Sept. 15 or Sept. 22. Jot down your answers on a postcard and send it to us. Any grade of 80 or better qualifies for our B.T.S. degree, complete with sheepskin.

1. Breeding in atomic energy is a term having to do with_____.
   a. aristocratic scientists
   b. fuel generation
   c. behavior of virile positrons
2. New in timepieces is a clock which ticks_____.
   a. once a year
   b. once an hour
   c. once
3. On Aug. 1 consumer credit hit _____, an all-time high.
   a. $21.2 billion
   b. $21.2 million
   c. $212 billion
4. In Washington, persons who don't own TV sets watch this medium about_____hours per week.
   a. 5
   b. 12
   c. 48
5. Great Lakes iron ore fleet hauled _____million gross tons in August for a new high.
   a. 34.1
   b. 14.3
   c. 143
6. July blast furnace production was _____.
   a. high
   b. average
   c. low
7. Political party which advocates strong federal development of resources is _____.
   a. Republican
   b. Democrat
   c. Vegetarian
8. In air hoses a 90 to 70 psi gage drop can drop production_____ per cent.
   a. 10
   b. 30
   c. 100
9. Large new steel mill in Pennsylvania represents an investment of _____per employee.
   a. $7.50
   b. $750
   c. $75,000
10. France is producing a little over _____million tons of steel per year, not counting the Saar.
    a. 1.1
    b. 11
    c. 110
11. Future capacity of U. S. mills to produce 120 million tons of steel will become a reality in _____.
    a. 1953
    b. 1960
    c. 1965
12. E. B. Newill takes over as boss of G.M.s_____division.
    a. Buick
    b. Truck
    c. Aeroproducts-Allison
13. Estimates are that with all defense business eliminated, today's peacetime machine tool business would come to _____million a year.
    a. $100
    b. $300
    c. $500
14. Last week was National _____ week.
    a. Dog
    b. Businesswomen's
    c. Window
15. Peak of _____ million tons in gray iron castings sales was reached last year.
    a. 1.5
    b. 15
    c. 150

Cover Stuff

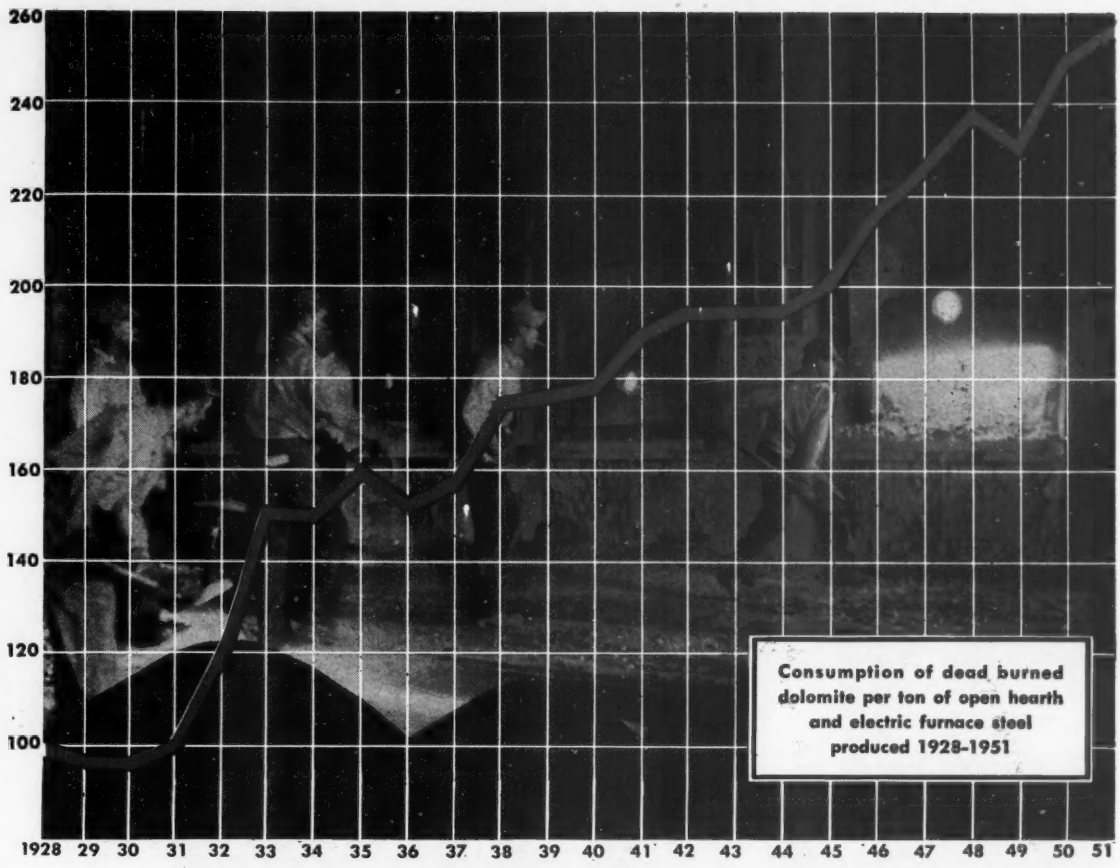
This week's cover shot goes with the continuous-forging article which appears east of here. It's a good yarn and was done by our Detroit Editor, Howard Tuttle.

The editors upstairs got a note from Howard the other day telling about the picture. It seems that when he went out to the Dodge Forge Plant for the pictures, the die was ready for changing. A. L. Gostow, plant manager, told the crew to hold up on the change until the pictures were taken. They ran off about 30 cranks in the process. The dies take about four hours to change.

As you can see from the cover photo, the trouble they went to was worth it.

Shrdlu

(Metalworking Outlook—Page 39)



just what is dead burned dolomite?

IT is a hearth maintenance refractory made from a relatively inexpensive raw material (dolomite). Under properly controlled manufacturing processes, dead burned dolomite develops certain inherent qualities advantageous to efficient, low cost maintenance—qualities which have led to a steadily widening acceptance by the steel industry.

Typically, dolomite suitable for dead burning shows a chemical analysis of lime 30.4%, magnesia 21.6%, silica 0.3%, other oxides 0.2% and carbon dioxide 47.5%. Prior to dead burning, quarried dolomite is classified to proper sizes and the very fine particles, along with clay and silt, are removed by washing.

The sized, washed dolomite granules, proportioned with a small percentage of iron oxide, travel through rotary kilns heated to above 3000°F. As they pass through the hot gases, the particles are first calcined, giving up approximately half their weight of carbon dioxide, and then sintered and shrunk to dense, hard clinkers. High temperature reactions convert calcium oxide to crystalline lime and magnesium oxide to periclase. Some lime also combines with iron oxide and silica to serve the refractory as a bonding agent.

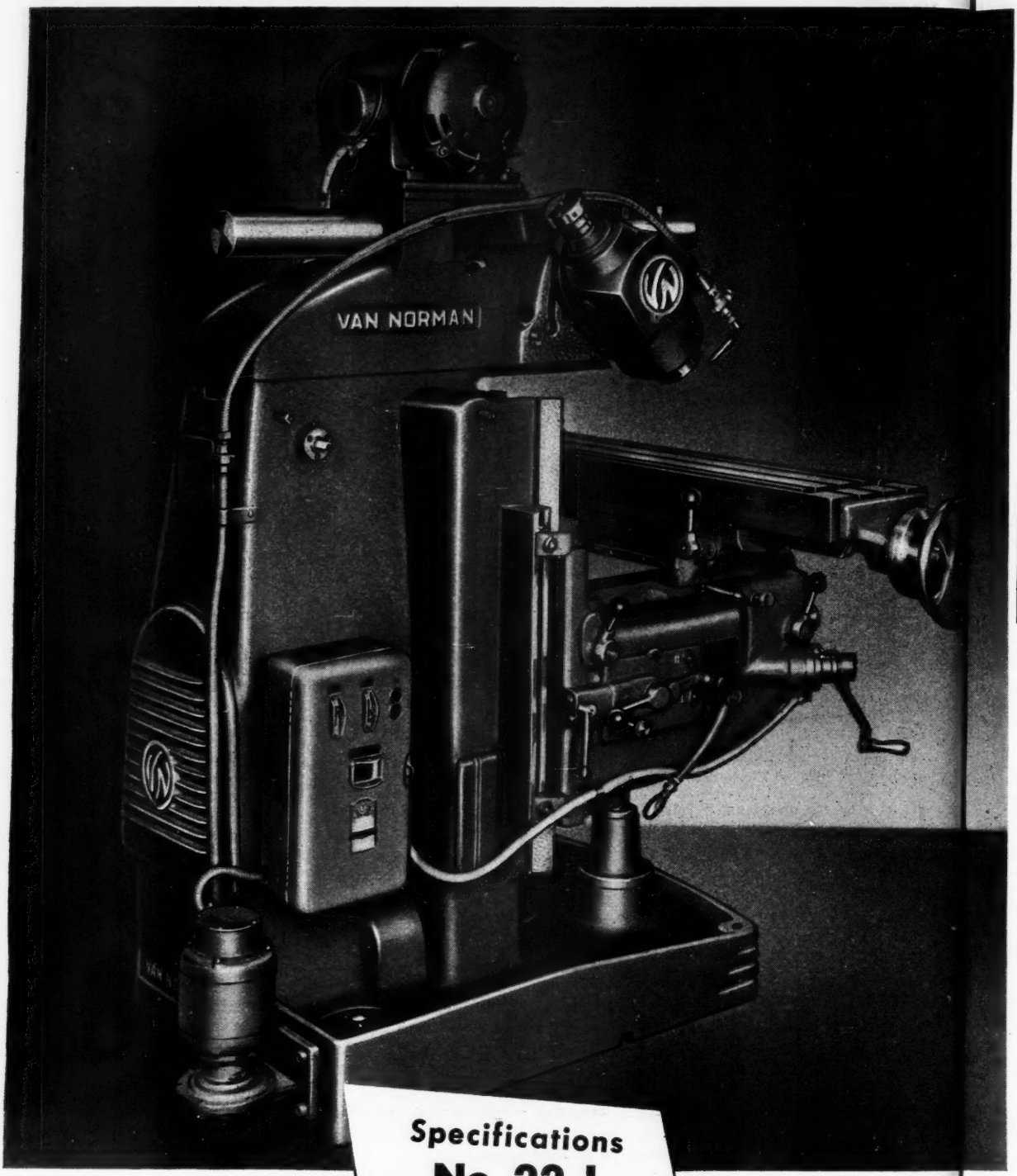
The resultant product has been variously called "double burned", "roasted", "sintered", "clinkered", "prepared", "black" and "dead burned" dolomite. Of these designations, dead burned is now the generally accepted term, indicating as it does the characteristic hard, dense, inert, crystalline, highly refractory quality of the material.

Dependable dead burned dolomite, marketed under the well-known trade names Magnefer and Syndolag, is manufactured by Basic Refractories at its Ohio Works—recently expanded to meet the industry's ever increasing use of this refractory.

Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

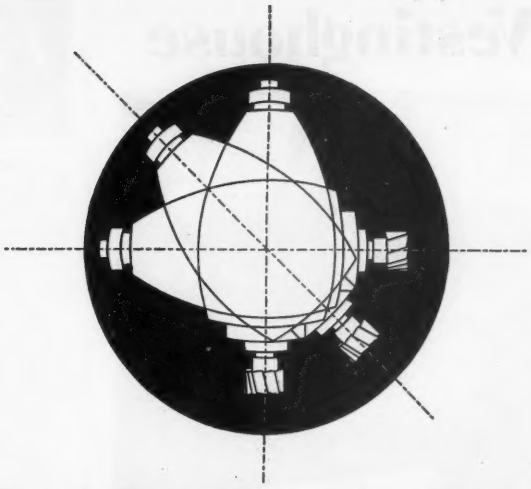
Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal



Specifications

No. 22-L

- Table: 45″ x 10″
- Cutterhead in angular position



The Adjustable Cutterhead

BROADENS THE WORK RANGE

of Van Norman Ram-Type Millers

Van Norman Ram-Type Millers mill the original setup at any angle from vertical to horizontal . . . through the full run of the table . . . without adjustments and with fewest re-setups.

Here's how it's done — operator simply swings the adjustable cutterhead from one position to the next, slides the ram in or out if need be, and goes ahead with the next cut. This extreme ease of operation and adjustment . . . applicable over an exceptionally wide range of work . . . reduces total completion time per piece, prevents errors, slashes costs. At the same time, quantity and quality of output is sharply speeded up.

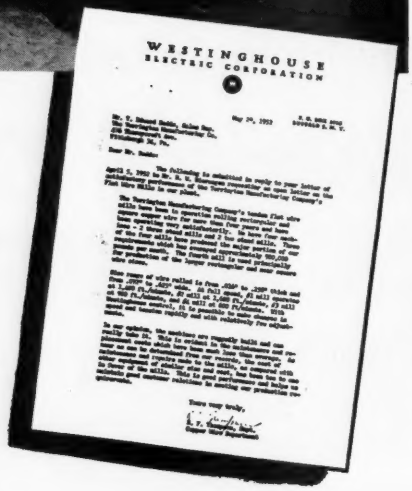
And here are some more important features that cut milling costs — directional control of power-feeds . . . 6-way rapid traverse . . . large, easy-to-read dials . . . wide speed and feed selection . . . rugged construction which assures maximum rigidity.

Van Norman Ram-Type milling machines will do your work faster, more easily and accurately. Six basic models available to meet every job, ranging from toolroom work to production milling. Write for catalogue.

VAN NORMAN COMPANY

SPRINGFIELD, MASSACHUSETTS, U. S. A.

TAKE IT FROM Westinghouse



TORRINGTON
high speed
FLAT WIRE MILL
LINES...

are ruggedly built...can really take it
...cost only 1/10 as much to maintain

The Superintendent of Westinghouse's Copper Wire Department at Buffalo — who has watched his 4 Torrington High-Speed Flat Wire Mill Lines deliver the goods for more than four years, writes:

"The machines are ruggedly built and can take it. . . . Cost of maintenance and repair, as compared with equipment of similar size and cost, has been ten to one in favor of Torrington Mills. This is good performance . . . and helps us maintain good customer relations in meeting our production requirements. . . . Three of the four mills have averaged 900,000 pounds per month; the 4th mill is used principally for production of the larger rectangular and near square sizes."

Call or write Torrington for information and name of nearest Torrington representative.

The **TORRINGTON**
MANUFACTURING COMPANY • TORRINGTON, CONNECTICUT

DESIGNERS AND BUILDERS OF MILL MACHINERY FOR SIXTY-FIVE YEARS

LETTERS
TO THE EDITORS

Is It a Sport Car?

As to your article in "Mirrors of Motordom" (Sept. 8, p. 71) speaking of Buick and Packard going into the sport car field, I hope you won't put me down as a crank when I say that neither car is in my opinion a sport car.

The Buick Skylark was here in town and I looked it over carefully. The principal characteristics of a sport car are

that it should be relatively light, eager, responsive, that it should corner well, that it should have breathtaking acceleration. The Buick, I submit, fulfills none of these specifications. And why go to the expense of wire wheels if you are going to put great, soft, spongy 8-inch tires on them? The real purpose of a cutaway door is to enable one to hang his arm out over it, for better handling of the wheel. Sitting in their car, one's elbow is still a good 6 inches below the upper surface.

In taking a turn at high speed, only intuitive calculation based on the "drag" of the wheel stands between you and rolling over. If you abolish that feeling through mechanical means you are removing the only safeguard you have.

The pathos of the situation lies in the fact that they will try out this thing and, if it flops, then for years thereafter the whole staff of General Motors engineers will say they once produced a sport car, it failed, and so therefore they have proved there isn't any market for one. If they ever were to bring out a true sport car on, say, the Oldsmobile 88 chassis, it would sell!

Incidentally, your weekly department is swell.

K. G. Merrill, president
M. B. Skinner Co.
South Bend, Ind.

Plastic Dies Step Forward

We're very much interested in your article "Plastic Dies Draw Truck Panels" (Sept. 15, p. 92).

These plastic dies were made for the Dodge Automobile Co. and we would appreciate your advising us the name of the company that makes them.

R. A. Joslyn
director of purchases
Coolerator Co.
Duluth, Minn.

• *It's Rezolin Inc., 5736 W. 96th St., Los Angeles.—ED.*

Interest to Voters Unlimited

I was very much impressed by the tabulation on "What Industry Can Expect" from the two presidential candidates (Sept. 15, p. 75). It seems to me that this terse summing-up of attitudes and policies shows such a clear balance in favor of Eisenhower that it would

Continued on following page

tool steel is our special pride!

Just as mother was known for a special dish, so Crucible stands for the finest in tool steel. For a half-century we have enjoyed this reputation. Naturally, we are proud of it.

We are keeping our research and development in step with industry's everchanging needs for tool steel. We are offering you the benefits of our metallurgical service to solve unusual problems. And we are maintaining full stocks in conveniently-located warehouses so you can get prompt delivery of tool steel.

SEND TODAY for the unique Crucible Tool Steel Selector—a twist of the dial gives the tool steel for your application.

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Peerless Hot Work Steels
Halcomb 218
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Sanderson Carbon Tool Steels
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Company_____ Title_____

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9" diameter, 3-colors

CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

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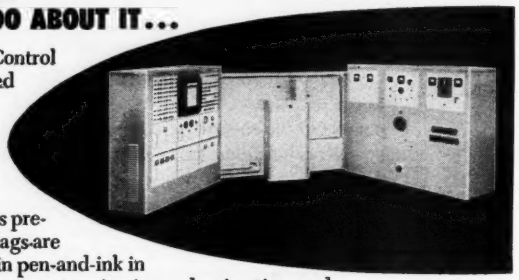
YOUR PRODUCTION AND PROFITS ARE BEING LOST HERE!

Are You Wasting Critical and Expensive Materials In Your Slag Heap?

Steel producers know that up to 20% of the alloying elements used in special steels, which have to be present, often are lost in the slag. Constant and tedious laboratory analysis of both the steel *and* the slag is necessary to maintain proper production control. In addition to loss of money in replacing these elements, much time can be wasted in actual production.

HERE'S WHAT YOU CAN DO ABOUT IT...



The ARL Production Control Quantometer—long used for chemical analysis of steel and other alloys—has now been adapted for the analysis of slags! Accurate percentages of elements present in *both* steel and slags are recorded permanently in pen-and-ink in less than two minutes...a great saving in production time and money. This makes it possible to prevent material loss *before* it occurs. Individual Quantometers are not limited to a single type of analysis, but can be designed to meet the requirements of many plant problems. As many as 25 elements as selected by the user can be accurately measured on the instrument—up to 20 simultaneously. The ARL Quantometer is the most advanced type of spectrometer yet developed, and its use can mean a great saving to you in production control costs and vital materials conservation. Write for complete information.

THE ARL LINE ALSO INCLUDES 1.5 AND 2-METER SPECTROGRAPHS, PRECISION SOURCE UNITS, RAMAN SPECTROGRAPHS AND RELATED ACCESSORIES.

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LETTERS

Concluded from preceding page

be expected to help any "independent" or "undecided" voter to make up his mind in short order. I wonder if a way could not be found to obtain wide circulation of this table. I am sending a copy of this letter to the Republican campaign organization.

Rodney Dean
405 West 47th St.
New York

• *Permission to reprint the article as it appeared in* STEEL *is granted.—ED.*

The Right to Rule

In your editorial "Why of Gobbledegook" (Aug. 18, p. 62) you quote a military procurement official on the complexity of defense contracts.

Is it not true that the specification for favoring firms in distress labor areas comes not from an Act of Congress but from the Manpower Directive no. IV issued by the Defense Production Administrator?

Charles C. Fichtner
executive vice president
Buffalo Chamber of Commerce
Buffalo, N. Y.

• *Yes, but the Defense Production Administrator derives his power from an Act of Congress: The Defense Production Act of 1950, Amended.—ED.*

Metal Printing, Mais Oui!

By way of the U. S. information service in Paris, we read with interest your article "Drums Printed Like Magazines" (Aug. 28, 1950 p. 93).

We would be interested in any information on metal printing in the U. S., especially the use of spirit varnishes on printed metal. We now overprint varnish and for certain fabrications (advertising posters, for example) it would be interesting to use the qualities of spirit varnishes.

M. U. Comfar
Impretal
Paris, France

• *For the information you request, we are sending a copy of your letter to R. Hoe & Co., and Rheem Mfg. Co., asking them to give you a resume of their experience in imprinting metallic drums. —ED.*

Forming Story Felicitation

I have just read your article "Thicker Boiler Plate Formed Faster" (Aug. 11, p. 84) and I want to express to you my appreciation for the very excellent manner in which you handled this story.

Roy Quinn
Babcock & Wilcox Co.
New York

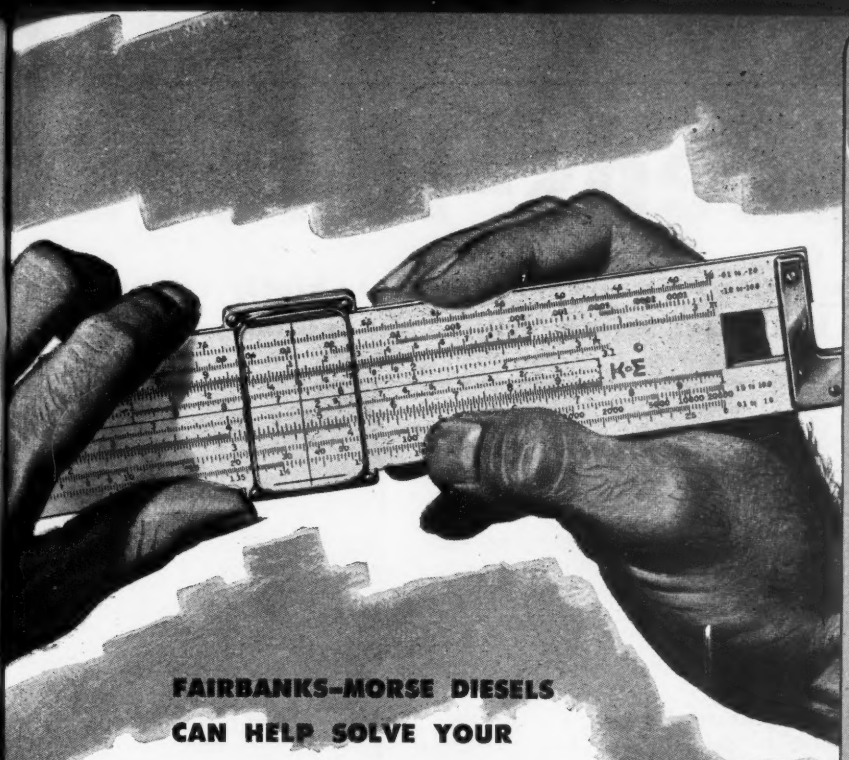
Nylon Use Bears Investigation

In the Aug. 4 issue of STEEL (p. 89) we read with interest the paragraph "Stops Sand Abrasion" in the "Engineering News at a Glance" column.

We would like further data on the use of nylon to extend core box service and would appreciate your giving us the address of the company concerned.

Garnet P. Phillips
general supervisor, foundry research
International Harvester Co.
Chicago

• *Write to Polymer Corp. of Pennsylvania, Reading, Pa.—ED.*



FAIRBANKS-MORSE DIESELS
CAN HELP SOLVE YOUR

Power Equation

Balancing the many elements of power requirements—against cost—is a major problem facing all manufacturers today. Failure to solve this complex equation can mean the difference between profit and loss.

But, is there a solution in *Your* Plant?

Look at this partial list of Fairbanks-Morse Diesel advantages and see. F-M in-plant power economically adds to current capacity as load increases . . . eliminates purchasing power at rates based on high peak demand values. Improved power factor. Better current characteristics. Flexibility. Economy. These are a few of the factors that can put your power equation in balance.

If you want the answer to your power equation, write us today outlining your needs. Fairbanks-Morse engineering can give you a proved answer . . . based on over 50 years' experience in industrial and municipal power generation. Fairbanks, Morse & Co., Chicago 5, Ill.

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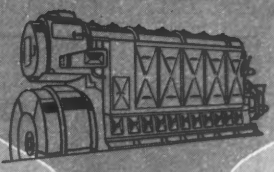


Put Your Power Costs and Performance in Order

1 ***Handle Peak Demand*** . . . reduce peak demand values for lower purchased power cost.

2 ***Raise Power Factor*** . . . "in-plant" generator can eliminate power factor penalties.

3 ***Emergency Power*** . . . insurance against lost production, damage due to line failures.

4 ***Handle Surge Loads*** . . . that may now be affecting current characteristics of entire plant.

5 ***Plant Expansion*** . . . need not be restricted due to lack—or expense—of ample power.

6 ***Useful Heat*** . . . lube oil, water and exhaust heat can cut drying and heating costs.

7 ***Chemical Value*** . . . exhaust gases are high in nitrogen—available for economical fixation of nitrates, ammonia.

8 ***Insurance Advantage*** . . . of diesel over gasoline engine, for example, will soon pay for installation.

9 ***No Weather Worries*** . . . ice, snow, sleet, wind storms can't stop plant operations.

10 ***Handle Increasing Load*** . . . "in-plant" power economically adds to current capacity as load increases.

11 ***Fuel Economy*** . . . use diesel oil, natural gas or sewage gas for added economy.

12 ***Remote Locations*** . . . distance from transmission lines needn't curtail planned plant expansions.

13 ***Compact Power*** . . . Fairbanks-Morse engines give you more power per foot of floor space, more power on present foundation.

14 ***Minimum Attendance*** . . . Fairbanks-Morse "in-plant" generating sets require minimum supervision and maintenance.

15 ***Save Cost*** . . . of running in new line where present transformers and power lines are already loaded.

36 speeds-18 feeds

Delivery may be better than you think on these highly versatile G&L floor-type horizontal boring, drilling and milling machines

FOR fast expansion of your production facilities, G&L Series 30 floor-type or openside machines may be scheduled for earlier delivery than you might think. They'll give outstanding versatility and accuracy to .001" on both extra-large specialized operations as well as for long-run standard production work.

G&L Series 30 models may be used either on top or alongside a floor plate, and also in conjunction with either power, or hand revolving and tilting tables. An end support mounted on its own runway provides outboard support and bearing for boring bars when required.

The floor-type machines can be made with greater work range than any other horizontal boring machine. Machine runways can be made in any length, and floor plates built up of standard sections so that one or several of them may be used to support large jobs.

Check this excellent work range

Both Series 30 models — the 350-F (5" dia. main spindle), and the 360-F (6" dia. main spindle) — also offer a high-speed auxiliary spindle. For boring and heavy milling operations you use the main spindle at speeds up to 500 rpm. Then, for high-speed drilling, tapping and light milling, the very sensitive high-speed spindle — easily reversed at speeds to 2000 rpm — is used. Twenty horsepower allows full utilization of modern, carbide cutting tools.

Another factor contributing to the extreme flexibility of these units is the ability of their column and headstock to operate either independently or simultaneously. Each operation is controlled by a single lever. With this arrangement, the operator can follow an irregular outline on die work, pads, flanges, etc.

Other features include: centralized controls . . . a telescopic vernier sight . . . safety devices for all traversing units . . . extra rigidity at extreme limits of machine and headstock travel.

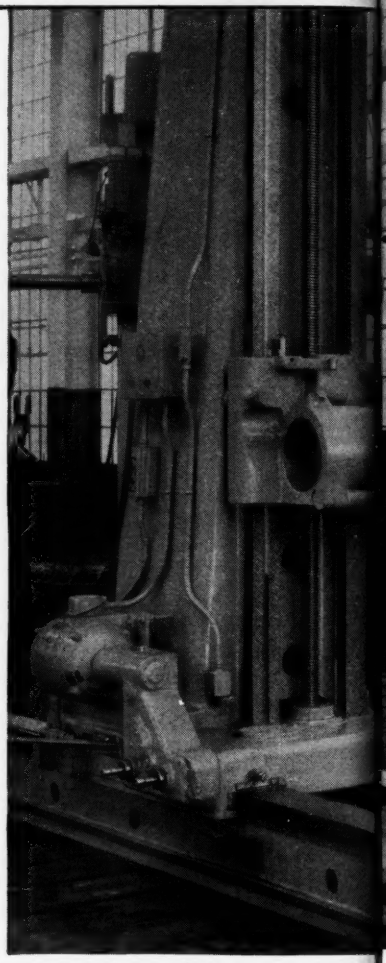
Write for complete details and delivery information today!

Simplified Specifications—350-F and 360-F

	Main Spindle 350-F	Main Spindle 360-F	High Speed Spindle 350-F	High Speed Spindle 360-F
SPINDLE DATA				
Diameter of spindle	5"	6"	2"	
Longitudinal travel	36"	48"	9"	
Range of speeds (in rpm) (36)	8.5 to 500		34 to 2000	
Range of feeds (per revolution of spindle) (18)	.005" to .250"		.001" to .062"	
Maximum distance top of runway to spindle centers	87"		95¾"	
MACHINE DATA				
Range of feeds to headstock and column movements (18)	.5" to 25"/min.			
Rapid traverse headstock and column	120"/min.			
Vertical travel headstock on column	72"			
Horizontal travel column on runway	72"			
Height of runway	14"			
1800 rpm constant speed motor	20 hp			
Approximate weight of standard machine	350-F 44,000 lb.—360-F 46,000 lb.			

LARGE CAPACITY MACHINES (optional work ranges)

Columns	84", 96", 120"
Runways	Furnished in any length in 2' increments
Over-size floor plates made up in 5 foot wide sections, in lengths of 120", 144", 168", 192", 216".	



Photos (upper, and lower le
show a G&L 360-F working
crawler-shovel base.

GIDDINGS & LEWIS

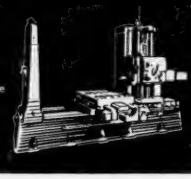
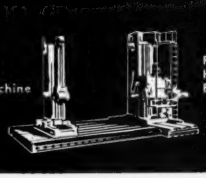
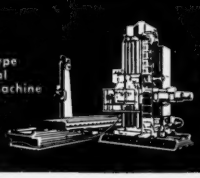


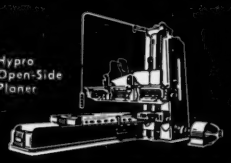
Table Type Horizontal Boring Machine



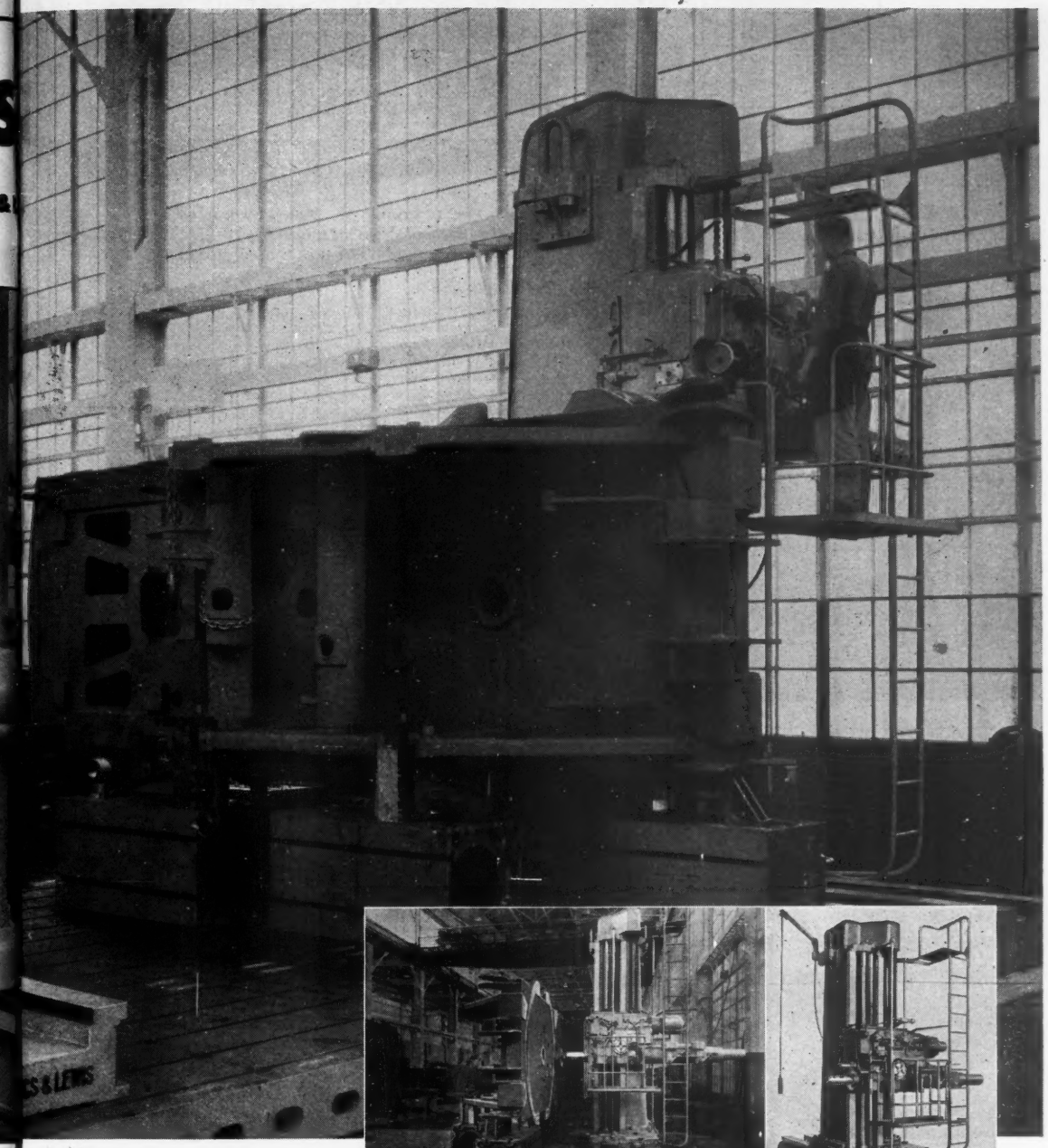
Floor Type Horizontal Boring Machine

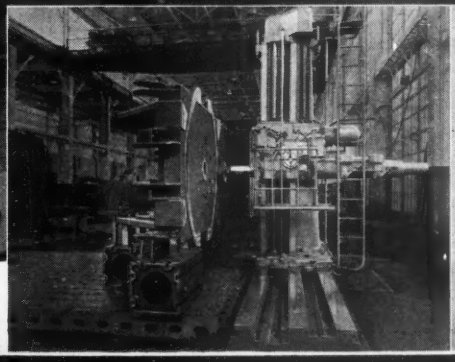


Planer Type Horizontal Boring Machine



Hypro Open-Side Planer





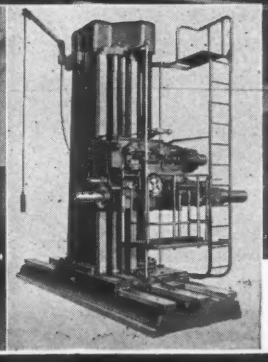
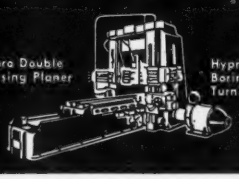


Photo (far right) shows G&L 350-F with pendant control.

MACHINE TOOL CO.

Hypro Planer Type Milling Machine



Hypro Double Housing Planer

Hypro Vertical Boring and Turning Mill

G&L HYPRO

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QUANTITY PRODUCTION OF GREY IRON CASTINGS

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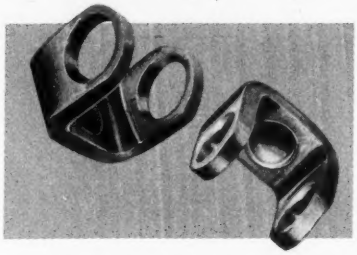
Facts you should know about U·S·S HIGH STRENGTH STEELS

Universal joint yokes, now stamped and cold formed from U-S-S MAN-TEN High Strength Steel

cost less, weigh less, show fewer rejects than forgings



Used on the steering shaft for International Harvester tractors, and others, the yokes of this universal joint, assembly-stamped and press formed from flat U·S·S MAN-TEN steel, are lighter, stronger and cost less than the carbon steel forgings formerly used.

● When the engineers of Mechanics Universal Joint Division of Borg-Warner Corporation decided to use stamped and formed U·S·S MAN-TEN high strength steel in place of a medium carbon steel forging for this highly-stressed part, a lot of people were openly skeptical.

Everyone agreed that U·S·S MAN-TEN steel was plenty strong enough to meet requirements. Obviously, too, if it could be used, the yokes would be lighter, would require less machining and the cost of heat treatment required after forging would be eliminated. So would the warping of the yoke "ears" during quenching and drawing that sometimes made it impossible to drill and ream the holes accurately. It sounded good, but the big question was, would the high strength steel take a ¼" radius 90° bend in a material ⅜" thick. To the confusion of the "experts" who said it couldn't be done, the answer was YES.

Now stamped and press-formed from 2" x ⅜" flat MAN-TEN steel these yokes are being successfully produced without any heat treatment—with all danger of warping eliminated, with holes drilled and reamed accurately in line. Costs are lower, rejections are minimized. The yokes weigh less, yet are extremely and uniformly strong—readily meet a 5000 inch-lbs. static torque test. In short, this unusual application of U·S·S High Strength Steel has proved "very satisfactory and less expensive."

As a result of this experience MUJ engineers are now considering the use of another U·S·S High Strength Steel (U·S·S TRI-TEN), similarly stamped and formed, for an even more critical part that has hitherto always been forged to achieve necessary strength.

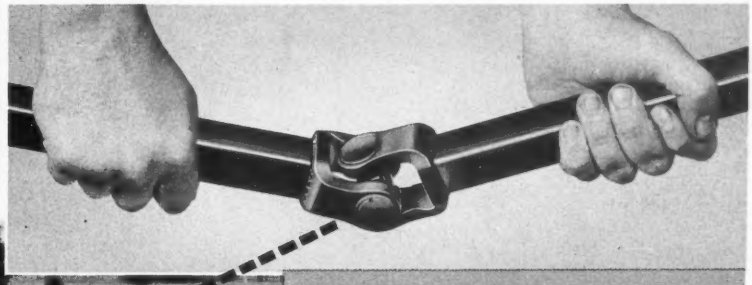
The above history is typical. It illustrates the varied and continually expanding uses to which U·S·S High Strength Steels are being put by alert designers who have recognized the economic possibilities of these versatile steels and who are using them in place of carbon steel—not only to improve their product but to reduce its cost.

What is U·S·S MAN-TEN STEEL?

U·S·S MAN-TEN steel is a grade of manganese-copper steel that, at relatively low cost, provides toughness, workability and weldability in a higher degree than obtainable in carbon steel of the same strength level. Its atmospheric corrosion resistance is slightly higher than that of copper steel.

U·S·S MAN-TEN steel, in thicknesses up to ½" inclusive, has a yield point of 50,000 psi min. and tensile strength of 75,000 psi min. Its abrasion resistance is greater than that of structural carbon steel (ASTM A7); its fatigue strength is approximately 40% higher, insuring greater ability to withstand vibration and reversal of stresses.

U·S·S MAN-TEN steel is produced in plates, shapes, bars, sheets, strip, special cold-formed sections and other forms. It is particularly recommended for use in light and intermediate thicknesses.



In these universal joint yokes, the replacement of a more costly, heavier forging with U·S·S MAN-TEN steel—stamped and press formed to close tolerances—makes unnecessary the quenching and drawing after forging which often warped the yoke "ears" and threw the bearing holes out of line. Fewer rejects result, as holes can now be drilled and reamed accurately with no danger of warping.

★ ★ ★

Here, used on an International Harvester tractor steering shaft, the MAN-TEN steel yokes in the universal joint easily meet the high torque strength requirements of this assembly.

UNITED STATES STEEL COMPANY, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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USS

UNITED STATES STEEL

"We get a better job because

—says William Saunders— U. S. STEEL

● Bill Saunders is a Manipulator Operator at our Homestead District Works Forge Department. He has the keen eye that comes from 9 years as a Crane Operator plus 16 years as a Manipulator Operator—the last 5 years with the same crew of men.

In case you've never watched a manipulator, it straddles the pit in front of a forging press; its powerful jaws clutch a 40 or 50 ton ingot when rotating and positioning it between the press dies. But the only way to understand why the manipulator man is so important is to actually talk to him. If you had a chance to talk to Bill Saunders, here's the way the conversation might go:

YOU: *"What's that piece you're forging now?"*

SAUNDERS: "It's a vertical column for a drop hammer. When we finish forging, it'll be cut in half to make two columns. This is an easy forging job."

YOU: *"An easy one? Then what makes a tough one?"*

SAUNDERS: "Rectangular blocks, for instance. They're hard to manipulate because we don't have any excess metal for the jaws to grab. I have to operate the jaws so they'll hold the piece tight, but not so tight that the piece is deformed. The blocks are usually short, and the manipulator has to work close to the press, so I have to be sure the jaws don't get caught in the press."

YOU: *"Who actually runs the whole operation?"*

SAUNDERS: "The Pressman—that's the fellow down by the press. We've been working together for over 5 years, and I can almost tell in advance just how he wants the piece positioned. That's one reason why we work so fast."

YOU: *"Doesn't working fast lower the quality of the job?"*

SAUNDERS: "No—it gives *better* quality. You see, if you fumble around with a piece too long, it'll cool off. That's not a big problem with ordinary carbon steel, but we'd ruin a high alloy or stainless ingot if we worked it too long. You can only work some of those stainless ingots about 5 minutes, then they have to go back to the furnace. We've *got* to work fast."

YOU: *"How about those big sleeves you make—how are they forged?"*

SAUNDERS: "First we take a 48 to 55 inch ingot and upset it into sort of a pumpkin or disc shape. Then we have big punches—they're just pieces of shafting—and we drive the punches down through the disc and make a hole in it."

YOU: *"You do all this on the forging press?"*

SAUNDERS: "Sure, we have to. After the hole is punched we insert a mandrel—a long shaft. Then this mandrel, with the forging hanging on it, is placed in the press opening and supported on V-blocks. Just think of an oversize pipe coupling slid over a piece of small rod. The upper press die comes down and works the top of the forging. The piece gets longer and the hole gets bigger while we work it."

YOU: *"Where does the manipulator come in?"*

SAUNDERS: "It does all the positioning for these operations. And then when we start forging, I rotate the mandrel and turn the piece so we can work it evenly."

YOU: *"I can see it's no easy job."*

SAUNDERS: "I'm just a small part of it. The Pressman, the men that operate the cranes and drive the press and the helpers—they're all important. Every man on the crew is an expert at his job, that's why we can work so fast. The customer gets a better product and he gets good delivery, too."

• • •

There's no such thing as a forging "production line." The quality of a forging is dependent almost solely on the individual skills of the men who actually make the forging. When you buy U·S·S Quality Forgings, able men like Bill Saunders work on them. With these men on the job, you can be sure of quality forgings—second to none. Please send inquiries to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

we forge fast"

MANIPULATOR OPERATOR

UNITED STATES STEEL

Facts you should know about U·S·S STAINLESS

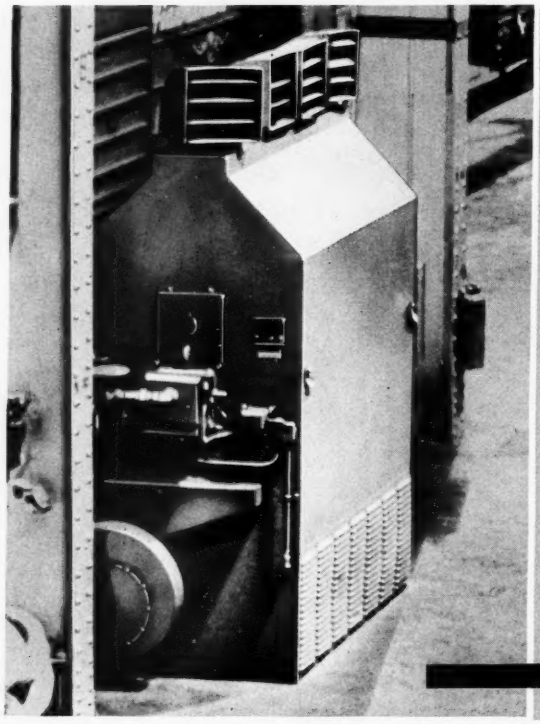
Before Korea, Dravo standardized on Type 430 for combustion chamber of *Counterflo* Heater

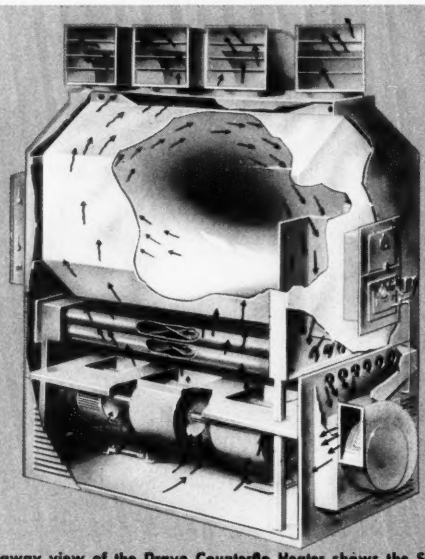
In recent months, much of the news about Stainless Steel has concerned manufacturers who have found available straight-chromium grades of Stainless Steel such as U·S·S 17 (Type 430) to be acceptable alternates for scarce nickel-bearing grades. But here's the story of a prominent manufacturer who made the change to Type 430 before the defense effort brought about severe restrictions on nickel-bearing Stainless grades.

When Dravo Corporation, Pittsburgh, Pa., redesigned its self-contained, direct-fired Counterflo Heater after World War II, the firm's engineers found they could avoid troublesome refractory maintenance, increase efficiency, reduce size and weight, speed up production and reduce manufacturing costs by building the combustion chamber of Stainless Steel.

Initially, both nickel-bearing and straight-chromium grades of Stainless Steel were used in this application. But in May, 1950—a month before Korea and several months before severe restrictions were placed on nickel-bearing grades—Dravo engineers decided to standardize on Type 430. This straight-chromium grade was found entirely suitable for the application, meeting requirements for high temperature operation. Maximum temperature that this combustion chamber is required to withstand is 1300°F.

U·S·S 17 Stainless Steel has high resistance to scaling and oxidation at elevated temperatures. Its low





A cutaway view of the Dravo Counterflo Heater shows the Stainless Steel combustion chamber and gives a good idea of the temperatures which Type 430 Stainless withstands in this application. Dravo Corporation says it has encountered no problems in brake forming or welding this straight-chromium grade.

A Dravo Counterflo Heater is installed in a large manufacturing plant.

USS

U·S·S STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

STEEL

USS STAINLESS STEEL
UNITED STATES STEEL

coefficient of expansion permits better design of heating and high temperature equipment.

It will pay you to investigate the properties of U·S·S 17 Stainless Steel and the other straight-chromium grades as well. Whether you are looking for an alternate for nickel-bearing Stainless Steel or contemplating a new application of Stainless, our representatives will be glad to advise and assist you.

NPA says no easing of nickel curbs in sight

In a press release dated May 27, the National Production Authority reported that a revision of prohibitions on the use of nickel is not even remotely possible at this time.

On the contrary, NPA said, there is a need for more stringent restrictions on the use of nickel-bearing Stainless Steels because of the continuing scarcity of nickel.

Prohibitions on the use of nickel in Stainless Steel are contained in NPA Order M-80.

At the same time, supplies of straight-chromium grades of Stainless Steel are good, NPA said, and new facilities that are about to come into operation may soon permit an expansion in non-nickel bearing Stainless Steel production.

The new Dravo 40 CD Crop Drier also is equipped with a combustion chamber of Type 430 Stainless Steel. The unit shown here is drying shelled corn.

Dravo also uses Type 430 in new 40 CD Crop Drier

Successful experience with Type 430 Stainless Steel in the Counterflo Heater led Dravo engineers to specify the same material for the combustion chamber of the firm's new 40 CD portable Crop Drier.

The designers calculated that this particular straight-chromium grade would insure long life for the drier—used on corn, hay, small grains and the like—with no need for maintenance in the combustion chamber.

Welding the Type 430 Stainless Steel combustion chamber of the 40 CD Crop Drier at the Machinery Division of the Dravo Corporation.

UNITED STATES STEEL COMPANY, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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UNITED STATES STEEL

Facts you should know about U·S·S CARILLOY STEELS

Non-critical Carilloy steel saves $40 a ton in gears of heavy-duty rotary pumps

● Commercial Shearing & Stamping Company, of Youngstown, Ohio, is now using a non-critical grade of U·S·S CARILLOY steel in the precision gears of their heavy-duty gear-type hydraulic pumps. Commercial Shearing finds that the gears made from the new grade more than meet the rugged performance requirements of hydraulic service; and, in addition, the new grade costs $40 a ton less than the more critical alloy steel previously used.

Pumps operate at 1,500 psi and 2,000 rpm

These gear pumps operate at pressures as high as 1,500 psi and speeds up to 2,000 rpm; gear wear of only 0.005 inch causes a substantial drop in efficiency, indicating that a tough, wear-resistant steel is needed to assure good, reliable performance. The steel normally used was rich in critical elements. Because of availability, it became necessary to consider a grade containing less critical elements.

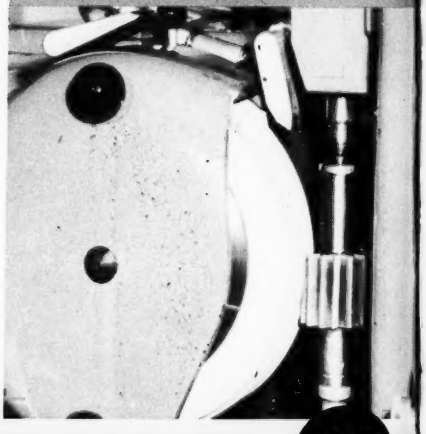
U·S·S Service Metallurgists were called in to recommend a suitable alternate steel. For this specific case, their advice was to use U·S·S CARILLOY 5120, an available straight-chrome alloy steel for the gears. It worked fine.

Easier machining and heat treating

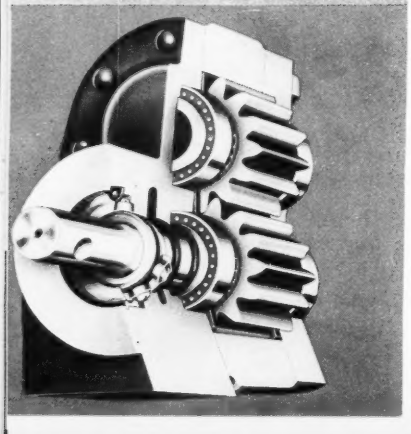
Commenting on the performance of this steel, Mr. T. C. Kane, Chief Engineer at Commercial Shearing & Stamping Company, says, "We are frankly surprised at the excellent results we are getting with this new grade. Not only do the gears meet all our high performance standards, but we find this steel easier to machine and heat treat, and we pay a lower grade extra on it. All told, the new grade saves us $40 on every ton of steel we buy."

This is the hobbing operation, the first step in machining these gears from bar stock.

The gears are finish machined to very close tolerances on precision grinders like this one. By changing from compositions containing critical alloying elements to those which are readily available, heat treating can be simplified, and, most important, costs can be reduced.



ed in the gears of these rotary pumps made by Commercial earing & Stamping Company, CARILLOY steel provides exptionally tough, wear resistant gears that more than meet the pped requirements of high-speed service.



U·S·S metallurgical assistance available on any steel problem

Like Commercial Shearing & Stamping Company, thousands of manufacturers have benefited from the expert technical assistance of U·S·S Metallurgists. With wide experience in every phase of steel making and fabricating, they can help you to select the best steels for your products or to adapt your metallurgical techniques to obtain maximum performance from the steels you are now using. To obtain their help just call the nearest U·S·S District Sales Office or write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS

UNITED STATES STEEL COMPANY, PITTSBURGH · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
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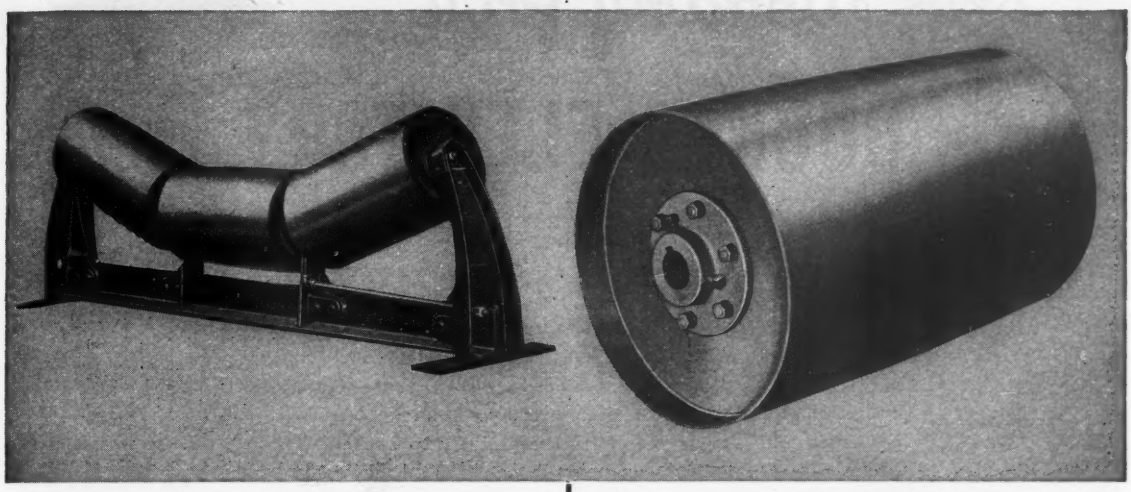
UNITED STATES STEEL

How Belt Conveyors by LINK-BELT
cut your handling costs



LINK-BELT Idlers require minimum lubrication and adjustment

BY MINIMIZING maintenance . . . holding "down-time" to a new low . . . reducing power requirements — Link-Belt Roller Bearing Idlers save you money.

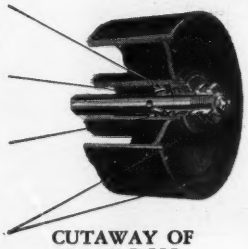
And, because of standardized design, Link-Belt gives you the famous "100" Idler or the heavy-duty "200" Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths. A complete line to meet any requirement.

Grease-in dirt-out, cartridge type unit seal preserves lubricant. No springs, no loose parts, no sliding metal-to-metal contact.

Large grease reservoir prolongs lubrication intervals.

Precision roller bearings maintain alignment.

Concentrically counterbored and journaled full-length central tube and counterbored roll shell are continuously welded to dished heads to maintain balance and bearing alignment.



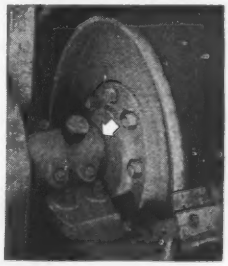
CUTAWAY OF "100" ROLL

LINK-BELT Welded Steel Pulleys minimize shaft deflection

MODERN Link-Belt welded steel design gives you lower maintenance and longer pulley life in more ways than one. Water- and dust-tight construction preserves balance, halts corrosion. Removable hubs — key-seated in line with two set-screws — are interchangeable with many other shaft sizes.

And for reducing shaft deflection (see below), you can't possibly get better protection than with Link-Belt Welded Steel Pulleys.

Since shaft bending moment increases in proportion to the distance between shaft bearing and pulley hub, it's easy to see why Link-Belt Welded Steel Pulleys are your best bet. Note how the bearing support and hub of the pulley are mounted with medium clearance. That's possible because Link-Belt hubs are flush with the pulley face.

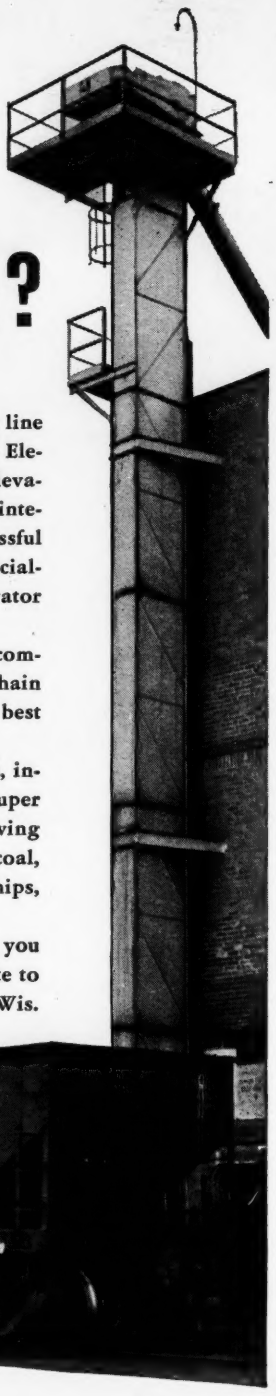


BELT CONVEYORS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12,534

LINK-BELT

looking for a BUCKET ELEVATOR?

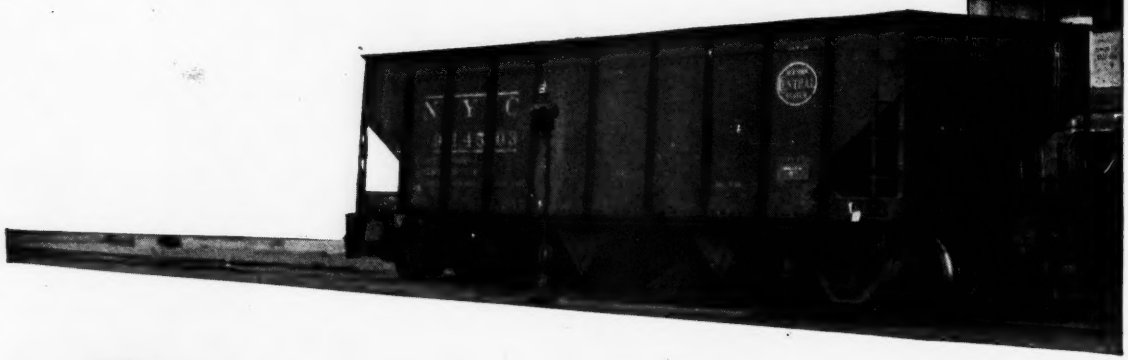


They're easy to find—when you make the complete Chain Belt line your starting point. Here, you'll find a standard Rex® Bucket Elevator to meet virtually every type of requirement. You'll find elevators that are dependable, long lived, that require very little maintenance. You'll find a design that has been proved by years of successful operation in almost every industry. And you'll find trained specialists—men who devote themselves exclusively to bucket elevator problems—ready, willing and able to help you all they can.

Remember, too, that in a Rex Bucket Elevator all the major components—buckets, chains, sprockets, housing—are made by Chain Belt Company . . . just one more reason why you're sure of the best when you specify Rex.

Rex Bucket Elevators are made in a wide variety of designs, including Centrifugal Discharge type, Continuous Bucket type, Super Capacity type. They can handle virtually every type of free flowing material. Here's a list of some of the most commonly handled: coal, cement, gravel, crushed limestone, salt, sand, sugar, wood chips, soda ash, pebble lime, foundry sand.

Your Rex Field Sales Engineer is well qualified to advise you about the best elevator for your needs. Call him today or write to Chain Belt Company, 4660 W. Greenfield Ave., Milwaukee 1, Wis.



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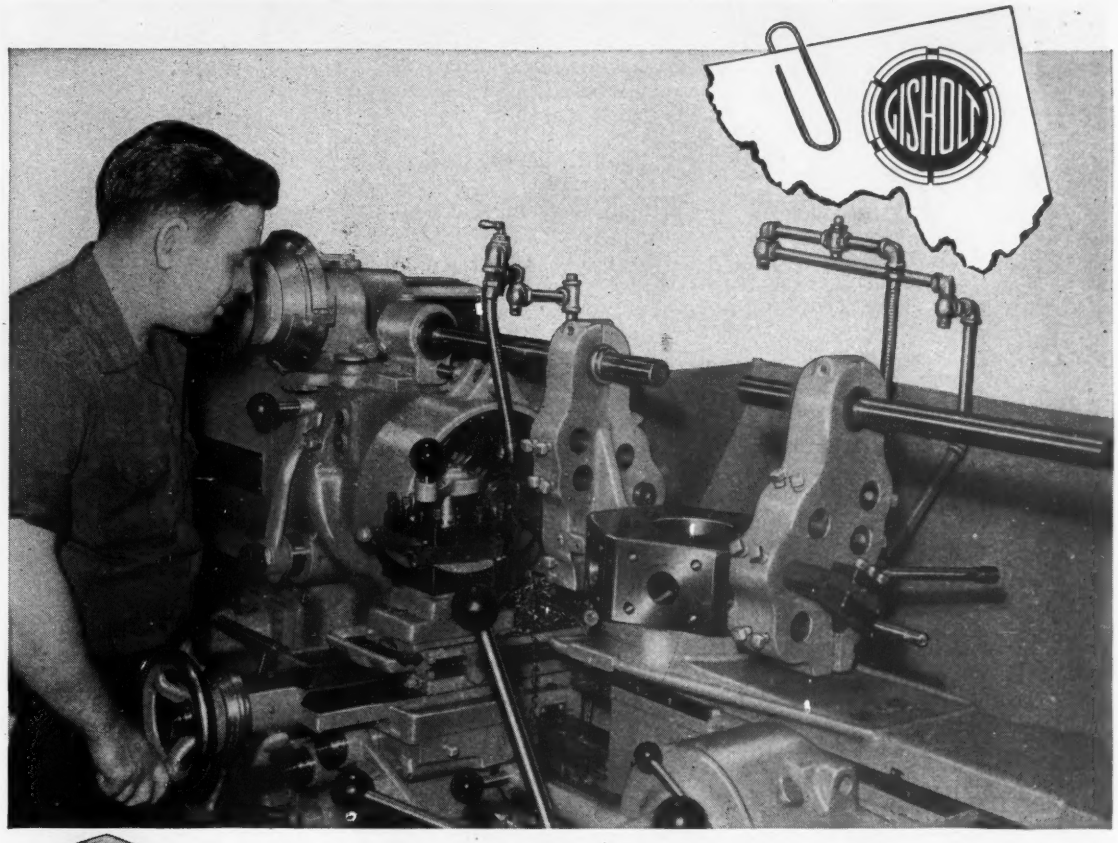
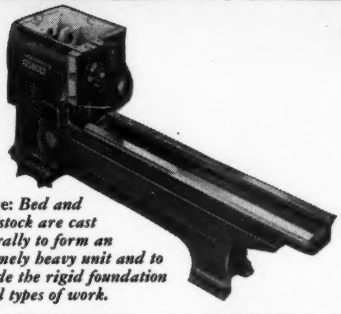




Above: *Bed and Headstock are cast integrally to form an extremely heavy unit and to provide the rigid foundation for all types of work.*

Below: *Block type ways are straddle keyed to the bed and ground in perfect alignment with the spindle. All working surfaces are hardened to 64-66 Rockwell "C".*

ACCURACY THAT DOESN'T "WEAR OFF"

Here are two good reasons why you can count on the accuracy of Gisholt Turret Lathes—now and years from now.

One-piece bed and headstock, cast as a heavy, rigid unit, reduce distortion and vibration to a minimum. Headstock is jig-bored to insure—and maintain—perfect alignment of spindle and drive shafts, with ample metal to provide the most solid support possible.

Hardened steel ways are augmented by hardened steel strips secured to the ram saddle, as well as hardened steel gibs and clamps, making an assembly that is virtually wear-proof. Its accuracy is further preserved by force lubrication.

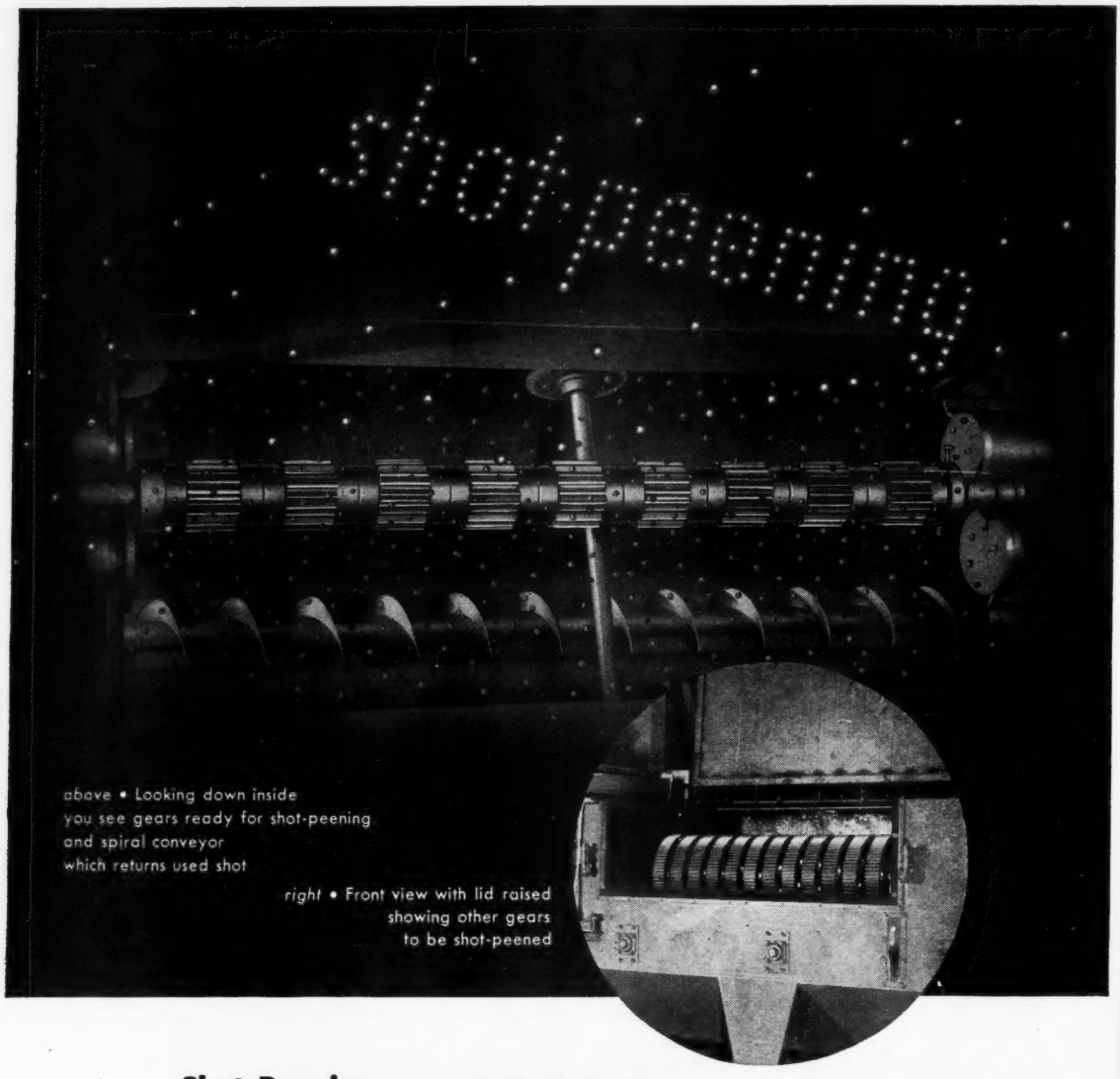
These advantages are yours for the long life of any Gisholt Turret Lathe. Ask for complete details.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

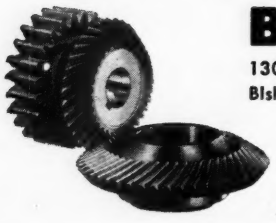


above • Looking down inside you see gears ready for shot-peening and spiral conveyor which returns used shot

right • Front view with lid raised showing other gears to be shot-peened

Shot-Peening is a method of toughening gears to make them wear longer. BRAD FOOTE'S shot-peening machine, one of the largest ever made, bombards the gear with shot under pressure. As each shot strikes it compacts the metal and hardens a minute area of the gear's surface.

• Shot-peening is another service which BRAD FOOTE has available for improving the quality of gears you buy for use in your own shop... or on the equipment you make for others. It is another step in our complete gear manufacturing process which means that *"no one shares our responsibility."*



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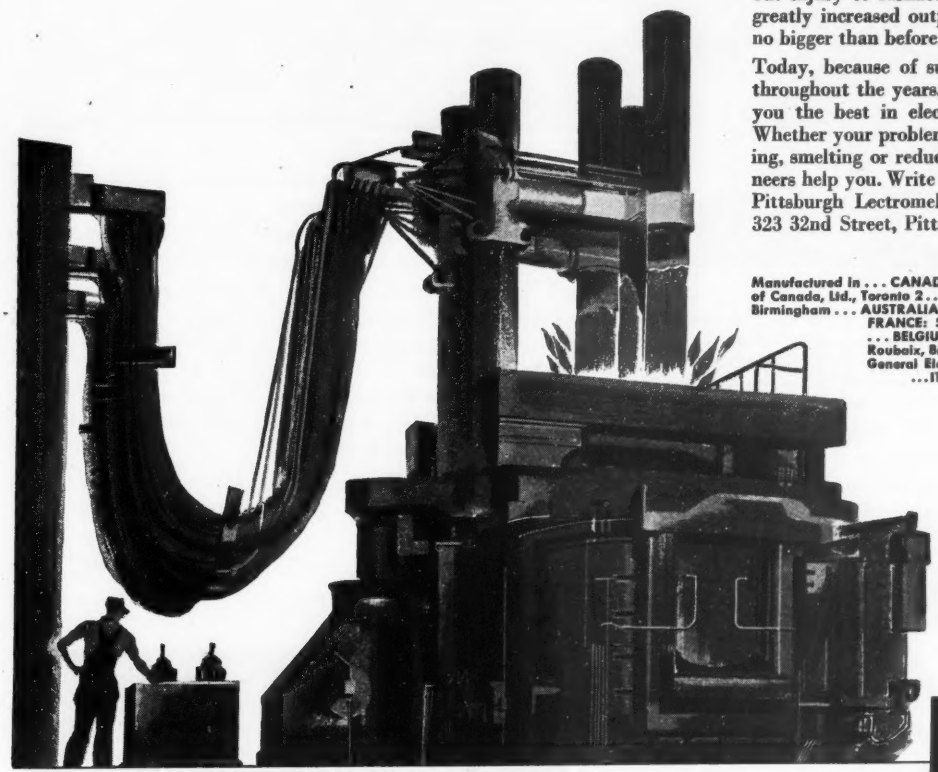
THEY THOUGHT IT COULDN'T BE DONE

but Lectromelt doubled electric furnace production by doing it!*

Other electric furnace designers said it couldn't be done. But Moore, inventor of the Rapid Lectromelt Furnace, dared to boost the power fed to arcs. Production zoomed as power input was pushed up. The day's work was doubled.

Lectromelt heavied up their construction generally, provided larger transformers and power leads, micro-accurate electrode control and more efficient cooling. That's how they got faster melting without injury to furnaces or charges, and greatly increased output from furnaces no bigger than before.

Today, because of such bold thinking throughout the years, Lectromelt offers you the best in electric arc furnaces. Whether your problem is melting, refining, smelting or reduction, let our engineers help you. Write for Bulletin No. 7, Pittsburgh Lectromelt Furnace Corp., 323 32nd Street, Pittsburgh 30, Penna.

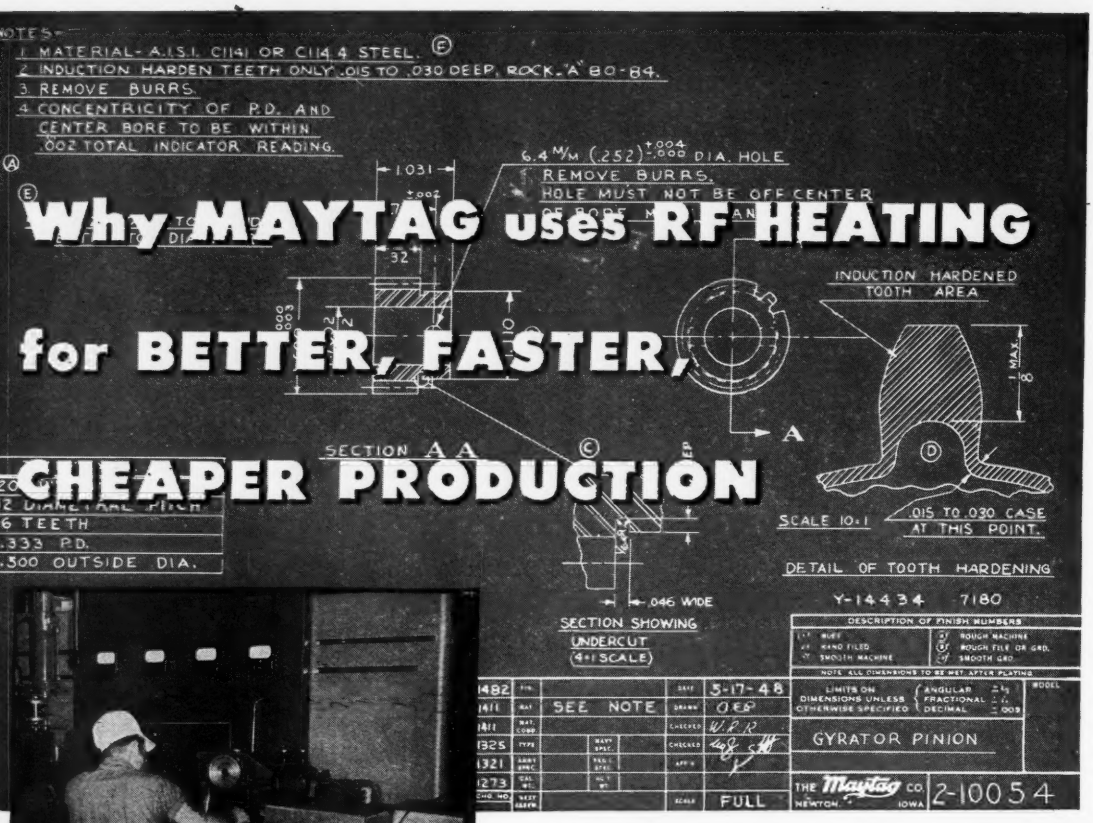


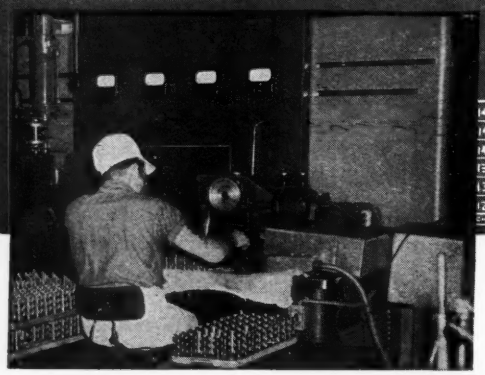
Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Brossoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa

*REG. T. M. U. S. PAT. OFF.

WHEN YOU MELT... MOORE RAPID *Lectromelt*

Why MAYTAG uses RF HEATING for BETTER, FASTER, CHEAPER PRODUCTION





● The Maytag Company has found, for fast production at low cost and high quality, Westinghouse RF Heating installations are the answer.

The installation of a process using two 20 KW-450 generators—for both spline and straight shaft hardening—has paid for itself in *less than 3 months!* This was shortly after World War II, and since then continued use has piled up real profit in savings.

In building a new plant for production of a completely new line of automatic washing machines, Maytag turned to induction heating for brazing and hardening . . . and they specified Westinghouse. A 50 KW and 10 KW RF generator, with associated work handling equipment, are now accounting for still further savings and continued high quality. That's why Maytag says that not only is the Westinghouse RF process the best method for heat treating production parts, but, also, "it produces precision work at the price of rough and ready work."

As we helped Maytag, let us help you solve your problems of increased production at low cost and with high quality. By all means, investigate the possibilities of installing Westinghouse RF Heating.

Westinghouse Electric Corporation
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Send me your informative case history booklet on induction heating.

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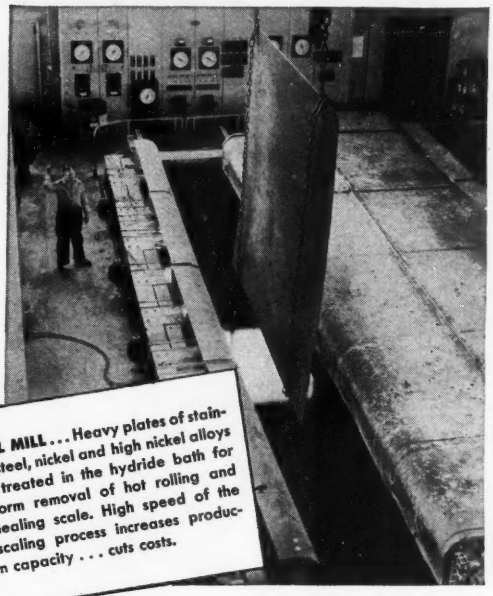
INDUCTION HEATING

NO SECTION TOO BIG . . . NO PART TOO SMALL



STEEL MILL . . . Heavy plates of stainless steel, nickel and high nickel alloys are treated in the hydride bath for uniform removal of hot rolling and annealing scale. High speed of the descaling process increases production capacity . . . cuts costs.

JOB SHOP . . . Heat treating scale is thoroughly removed from stainless steel scissors in compact, manual descaling unit. Hydride descaling eliminates tedious hand cleaning, preserves dimensional tolerances, and simplifies subsequent buffing and polishing.

FOR THE
DU PONT SODIUM HYDRIDE DESCALING PROCESS

FROM OUNCES TO TONS! That's the capacity range of current sodium hydride installations in mills, factories and job shops of all sizes. And with each unit, the same results—speedy, uniform descaling of many different metals at a saving in time and material. Hydride descaling leaves surfaces clean and bright . . . does not attack base metal. Yet, scale is thoroughly removed from even the most intricate part by the penetrating bath action.

FOR MORE INFORMATION about the Du Pont Sodium Hydride Descaling Process, just get in touch with our nearest district or sales office or send the coupon below to: E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

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OUTSTANDING ADVANTAGES OF THE SODIUM HYDRIDE PROCESS

- **HIGH-SPEED OPERATION**—Descales in shortest practicable time cycle . . . can be adapted to manual, conveyorized or continuous operation.
- **NO LOSS OF BASE METAL**—Bath action is reducing. Reaction stops when oxygen is removed from scale, eliminates pickling losses, etching and pitting.
- **ECONOMICAL TO OPERATE**—Permits savings in acid and metal . . . handles large volume of work in small space . . . is non-electrolytic.
- **HANDLES DIFFERENT METALS**—Alloy steel, stainless steel, nickel, copper, titanium and cobalt bearing alloys can be efficiently descaled—even in the same bath.
- **UNIFORM DESCALING**—On all surfaces without need for special racking procedures.
- **USES LOW-COST EQUIPMENT**—(Carbon Steel Tanks). NO HYDROGEN EMBRITTLEMENT.

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
Wilmington 98, Delaware

Please send me more information on the Du Pont Hydride Descaling Process: advantages, applications, equipment used. I am interested in cleaning_____products.

*Name*_____ *Position*_____

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DU PONT
Sodium hydride process for positive descaling

DU PONT REG. U.S. PAT. OFF. 150th Anniversary

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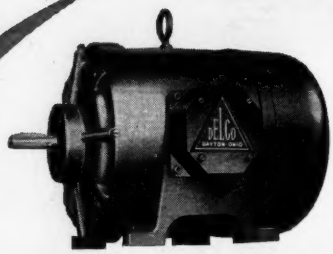
where power is part of the product, you're right with a DELCO

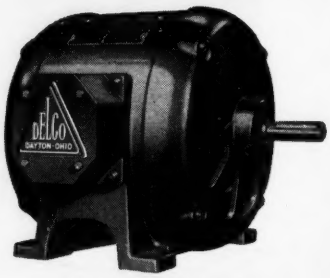
When you need motors—to serve as a *part* of your product or to help you *make* your product—look to Delco for the motors that will serve you best.

Delco produces motors for practically every known purpose . . . and each Delco motor is *engineered* for the kind of work it has to do. It's made of the finest materials, and constructed to stand up longer under the roughest conditions.

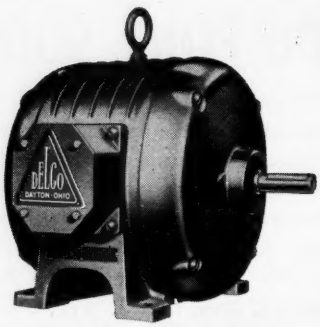
So check on Delco. You'll find Delco motors fit your needs, and that Delco always delivers on time. For complete details, write to Delco Products, Dayton, Ohio, or call the nearest sales office listed below.



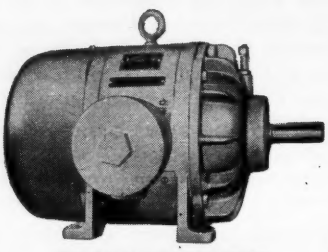
TOTALLY ENCLOSED FAN-COOLED MOTOR



OPEN BALL-BEARING MOTOR



TOTALLY ENCLOSED MOTOR



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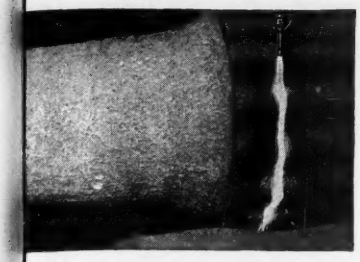
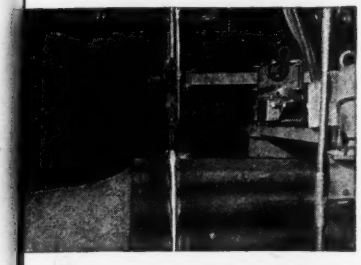
DELCO FEATURES MAKE DELCO FINEST

A 31-TON INGOT *SLICED* IN 35 MINUTES!

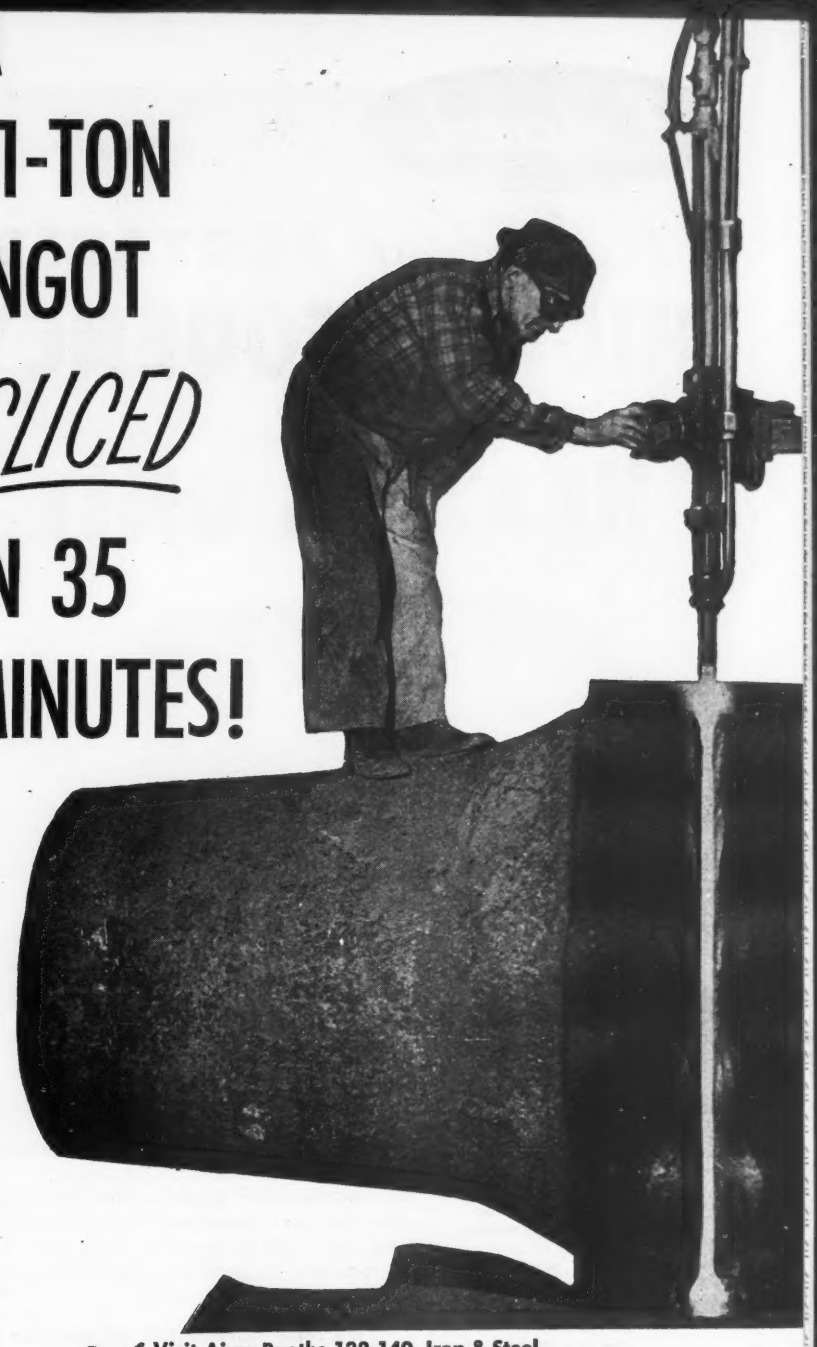


OING... Cropping massive ingots to workable size is a routine operation at the Canton, Ohio plant of Industrial Forge & Steel, Inc. Shown here is a 62,500 pound corrugated steel ingot with an Airco No. 6850 heavy duty torch in position and starting the cut. Cut must be exact to produce a rough forging of specified weight.



OING... This section was first heated to 600°F. After five minutes of torch preheating, the 6850 was put into action at a forward speed of approximately 15 inches per minute. Halfway through this huge section, the cut is clean and symmetrical . . . yet the operation is virtually unattended!

ONE! Note the smooth "face" on the severed ingot. This photo was taken 35 minutes later . . . and the ingot is now some 21,524 pounds lighter — "precision-cropped" to a weight tolerance. The Airco 6850 will do a similar job on sections that range from a foot in diameter — to a full six feet . . . and tips are available for acetylene and other fuel gases. For details contact the nearest Airco office!



Visit Airco Booths 138-140, Iron & Steel Institute Meeting, Cleveland, Ohio, Sept. 30—Oct. 3. See the 6850 torch and a "live" Aircomatic® demonstration.

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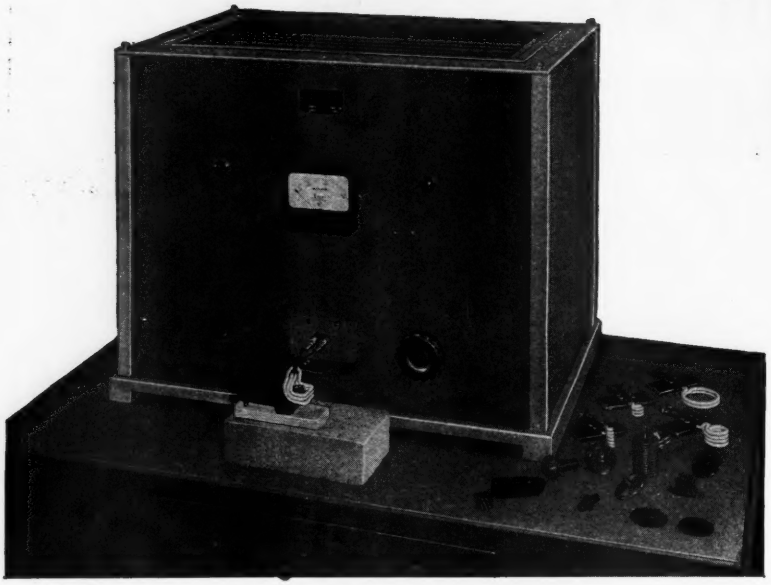
A Low Cost PORTABLE HIGH FREQUENCY Induction HEATING UNIT



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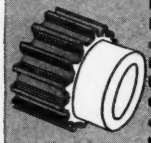
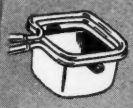
Permits widest choice of silver or copper brazing alloys from lowest to highest melting points. Ideal for brazing carbide tips.

HARDENING



Heat localized exactly where wanted at desired temperature. Ideal for gears, cams, bearing surfaces, cutting tools and other areas that are subject to wear.

SOLDERING

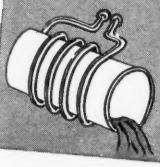


Speedily and neatly performs intricate soldering applications with or without the use of pre-formed rings.

ANNEALING

Ideal for annealing, stress-relieving, normalizing or pre-heating selected areas.

MELTING



Readily melts quantities of ferrous and non-ferrous metals in either graphite or ceramic crucibles.

- **SMALL AND COMPACT** Conveniently operated on bench or table—no mounting necessary.
- **ECONOMICAL OPERATION** No special power installation required. Operates on 110 volts, 60 or 50 cycle line at unity power factor.
- **FULLY GUARANTEED** Guaranteed for continuous duty cycle and stated performance.

This versatile unit is priced so low that every shop may now take advantage of modern induction heating techniques to improve quality and to increase production. Its simplicity of operation eliminates the need for skilled personnel.

The Lepel Model 2 KW will meet the requirements of machine shops, toolrooms, research laboratories and educational institutions. It is especially suitable for hardening, brazing and soldering small parts of either ferrous or non-ferrous metals.

Complete unit with line connection and load coil.

$870.

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WILL HEAT TO 1500° F.

⅛"	steel	rod	1"	length	in	approx.	1 second
¼"	"	"	"	"	"	"	3 seconds
½"	"	"	"	"	"	"	15 seconds
1"	"	"	"	"	"	"	60 seconds

Will melt 4 ounces of brass or steel in 4 minutes.
Equally well suited for heating of non-ferrous metals.

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From deep inside a mountain—
GOOD NEWS FOR ALUMINUM USERS

The availability of aluminum will be increased materially by new production facilities already well into construction at Kitimat, in the mountain wilds of British Columbia. There Aluminum Company of Canada, Ltd. ("Alcan"), whose products we distribute, is building a new plant, which in its initial phase will provide 200 million pounds more aluminum per year.

Abundant low-cost power is needed to produce aluminum economically. To serve Kitimat, a great hydroelectric plant will be installed inside a mountain. Water will travel through ten-mile tunnels, such as the one shown above, and drop half a mile to the power house, located inside a cavern.

Meanwhile, from existing facilities, millions of pounds of Alcan aluminum are helping to keep over a million metal-workers busy in American foundries and fabricating plants, turning out thousands of lightweight, long-lasting aluminum products for defense, industry, farm, and home.

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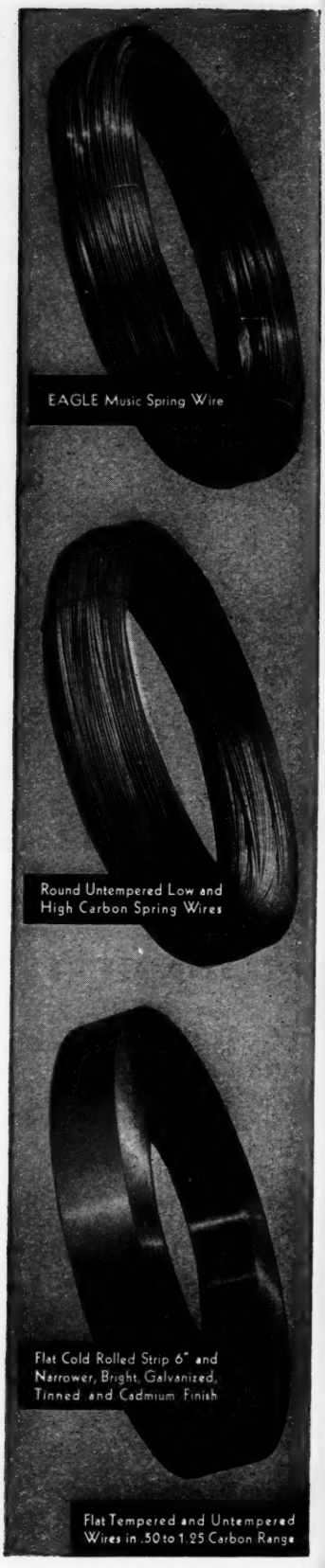
EAGLE Music Spring Wire
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Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish
Flat Tempered and Untempered Wires in .50 to 1.25 Carbon Range

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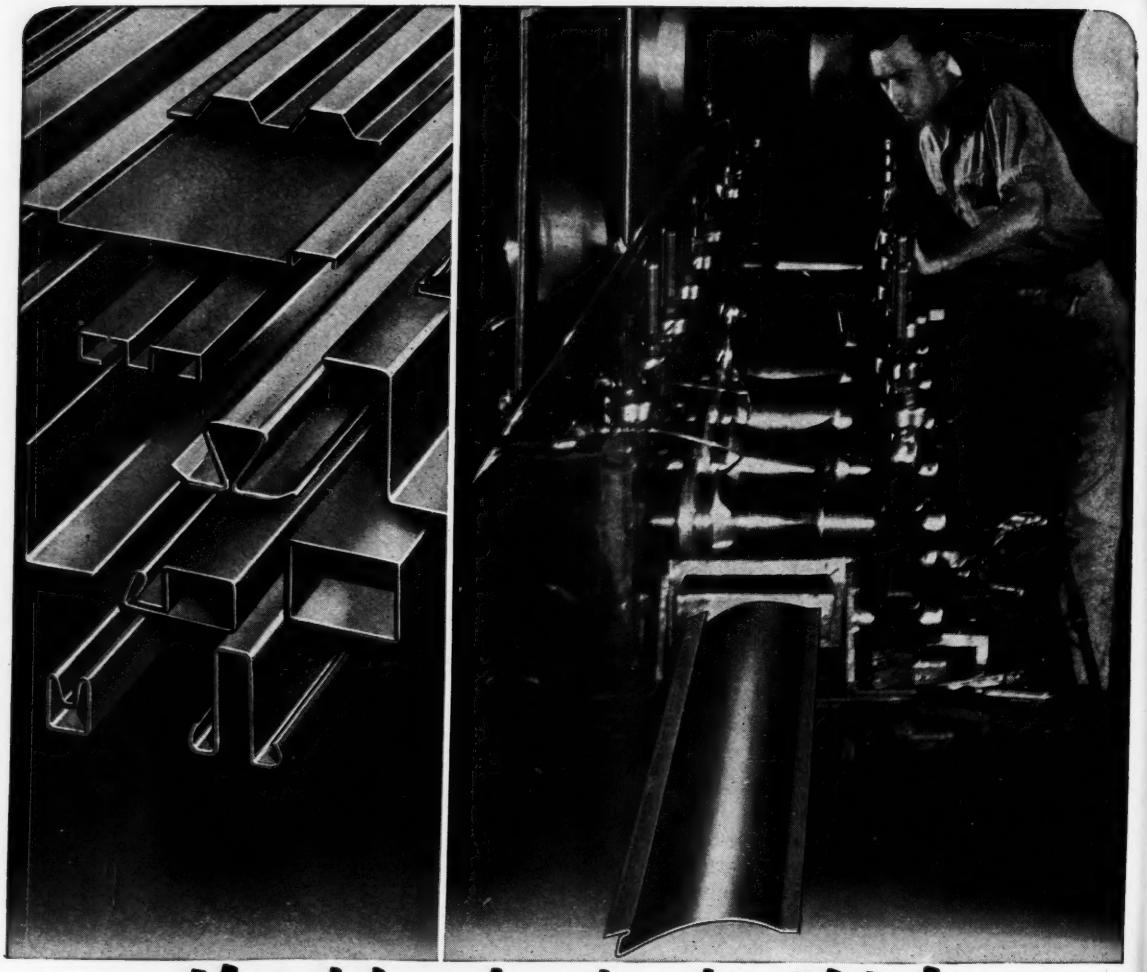

Metal Lumber by the Mile!

Not only rough but finished "lumber," mouldings and trim, are made in an endless stream on a Yoder Cold Roll Forming machine, from coiled metal strip.

The photo shows the production of siding by Kaiser Aluminum and Chemical Corporation, Oakland, Calif. The strip goes in at one end, is perforated and formed, coming out at the other as finished siding, automatically cut to length, ready for installation.

As a matter of fact, almost anything that can be made from lumber can now be made more accurately, better and more cheaply from metal, by this method. Plain steel angles, channels and Z's up to ½" thick, take the place of conventional framing lumber. More intricate shapes, combining structural strength with decorative value, serve for mouldings, panels and trim.

Billions of feet are now made annually on Yoder machines, owned by manufacturers of buildings and their components, furniture, electric appliances, automotive equipment, etc.

Yoder book on the function, scope and economics of Cold Roll Forming, sent on request. Consultations and estimates for the asking.

THE YODER COMPANY • **5502 Walworth Ave., Cleveland 2, Ohio**

Complete Production Lines

- ★ **COLD-ROLL-FORMING and auxiliary machinery**
- ★ **GANG SLITTING LINES for Coils and Sheets**
- ★ **PIPE and TUBE MILLS–cold forming and welding**

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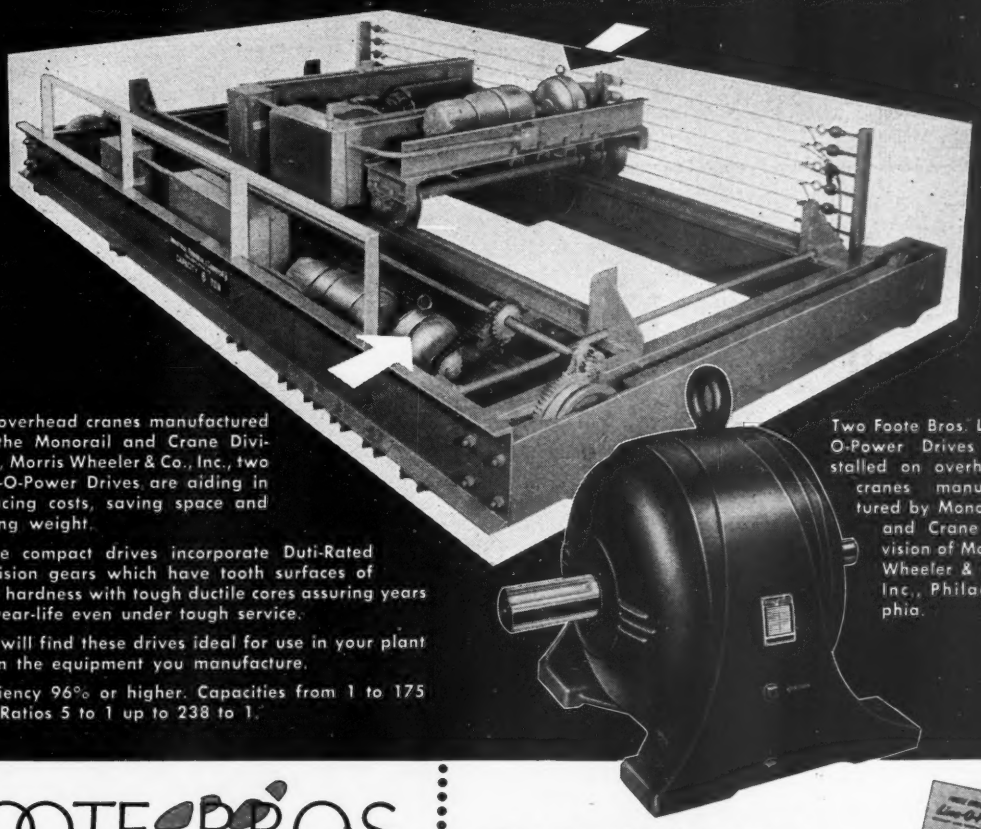
HOW MORRIS, WHEELER & CO., INC.

CUT Original Cost : CUT Operating Cost

SAVED SPACE • SAVED WEIGHT

with FOOTE BROS. Line-O-Power Drives



On overhead cranes manufactured by the Monorail and Crane Division, Morris Wheeler & Co., Inc., two Line-O-Power Drives are aiding in reducing costs, saving space and saving weight.

These compact drives incorporate Duti-Rated precision gears which have tooth surfaces of high hardness with tough ductile cores assuring years of wear-life even under tough service.

You will find these drives ideal for use in your plant or on the equipment you manufacture.

Efficiency 96% or higher. Capacities from 1 to 175 h.p. Ratios 5 to 1 up to 238 to 1.

Two Foote Bros. Line-O-Power Drives installed on overhead cranes manufactured by Monorail and Crane Division of Morris Wheeler & Co., Inc., Philadelphia.

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Better Power Transmission Through Better Gears

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Please send me a copy of Bulletin LPB on Foote Bros. Line-O-Power Drives.

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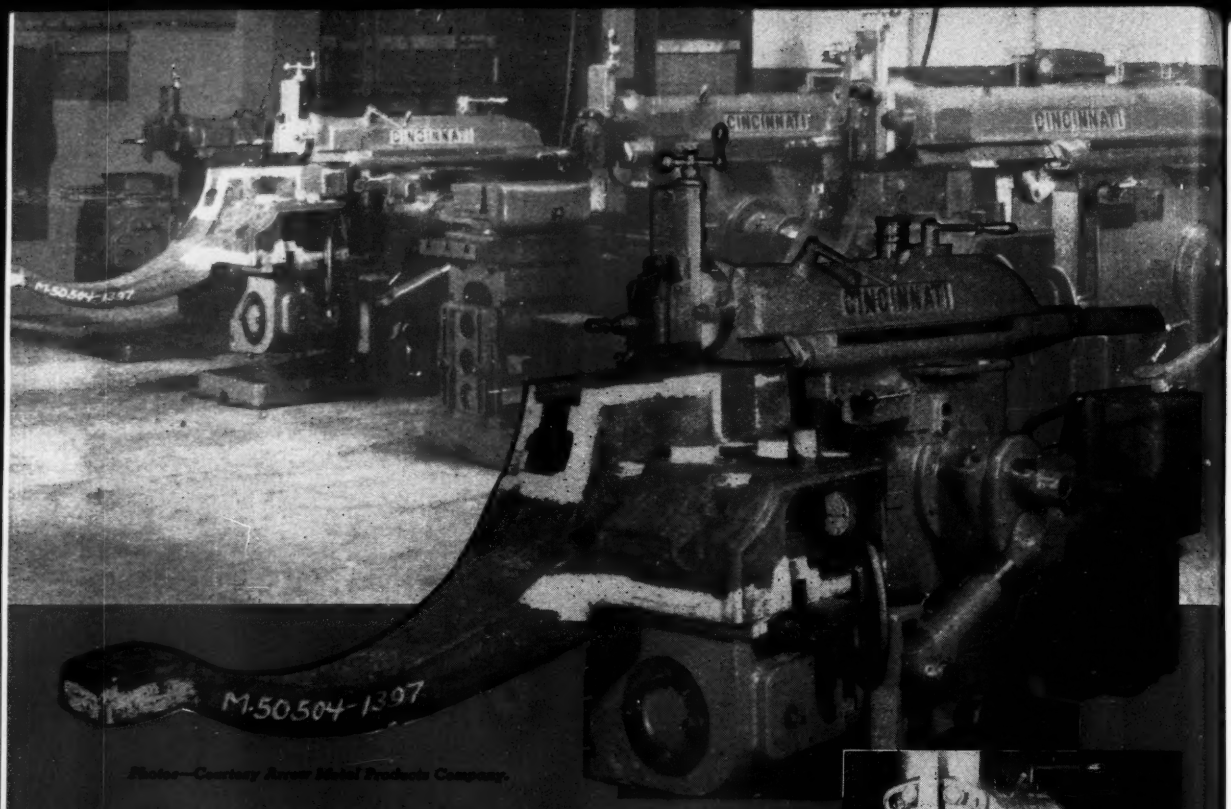

Photos—Courtesy Arrow Metal Products Company.

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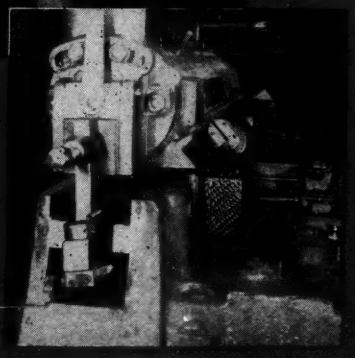
Cincinnati Shapers can be profit builders for you. Write for Catalog N-5 for full information.



An unusual undercutting operation

These large sidearms for stamping presses are machined on Cincinnati Shapers very profitably and efficiently, for two reasons—low investment and accurate, speedy performance.

This battery of rigid, powerful Cincinnati Shapers at Arrow Metal Products Co. is equipped with the Electro - Magnetic Clutch for speed and dependable operation. Modern controls are conveniently located for the operator, and also contribute to efficiency.

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CINCINNATI

The Metalworking Outlook

September 29, 1952

Clearer: Defense Spending Picture

After all the sound, fury and conflicting statements from government officials about defense spending, this picture emerges. Some $58 billion will be spent in fiscal 1953 which ends next June 30. Expenditure obligations are being made now at about $5 billion a month, which assures national security spending at near the peak annual rate of $58 billion for at least the next nine to 12 months. After that, the federal military outlays will probably decline, but they'll still be high—more than $40 billion—for another year. All this is based on the assumption that no World War III develops.

Budget Troubles in Washington

The mobilization agencies in Washington are all having budget troubles. NPA is especially alarmed because there's a possibility that by yearend it will run short of funds to run its program. If that happens, the planners may have to come up with a decision to end controls sooner than they want to.

New Emphasis in Expansion

Watch for a shift in expansion from basic materials like steel to end products like electrical machinery. The trend can be seen after a study of tax amortization certificates. A year ago 70 or 80 per cent of the weekly approvals were for expansion of basic-materials production; now 40 per cent are for that class, 60 per cent for expansion of end-products output. The Korean-inspired expansion by industry will cost $30 billion by the time it's finished. About 35 per cent of it was completed in mid-1952; about 50 per cent of it will be finished by the end of this year; some 65 or 70 per cent of it will be ready for operation by the end of 1953.

Inventories Improve

The balance in the metalworking industry's inventories is improving, but there still are problems. Total business inventories, now hovering around $69 billion, should rise moderately over the rest of the year and reach about $70 billion, equal in dollars to the stocks at the end of 1951, but down about 5 per cent in physical volume because of inflation.

Steady Backlogs Ahead

Unfilled orders for metalworking companies now average about five and a half months of sales. About the time of Korea they were a little over two months of sales. Many companies deviate from the average, of course. Aircraft, for example, has a seven-year backlog; electronic equipment, seven to eight months. You can expect the level of backlogs to remain stable for the rest of the year.

Suburban Offices?

A trend's developing among companies with large administrative staffs in big cities to move them to outlying areas. Union Carbide & Carbon Co. has under purchase contract the James Butler estate near White

Production-Engineering News—p. 75 *The Market Outlook—p. 139*

Plains, N. Y. It contemplates the erection of a new office building but it will be several years before the tentative plans take shape. General Electric Co. has purchased land in the same general area and is considering making the same move as Union Carbide.

The Cost Goes Down

The cost of building nuclear reactors is going steadily down, and their commercial use to provide moderate amounts of power in remote areas may not be far off. The cost is still not down to the point where reactors can compete with power generated in areas where coal or water is readily available. A reactor once cost $50 million; it can now be built for $5 million.

Catapults for the Navy

The Navy is moving to meet the problems created by bigger and heavier planes now being produced and still to be designed for use on carriers. At the Patuxent River Naval Air Test Center in southern Maryland, the Navy will let a contract in about three months for a steam catapult, the first to be installed in the U.S. The objective: To find out how a carrier-based plane behaves before it goes into mass production or, in any event, before it is assigned to the fleet.

Straws in the Wind

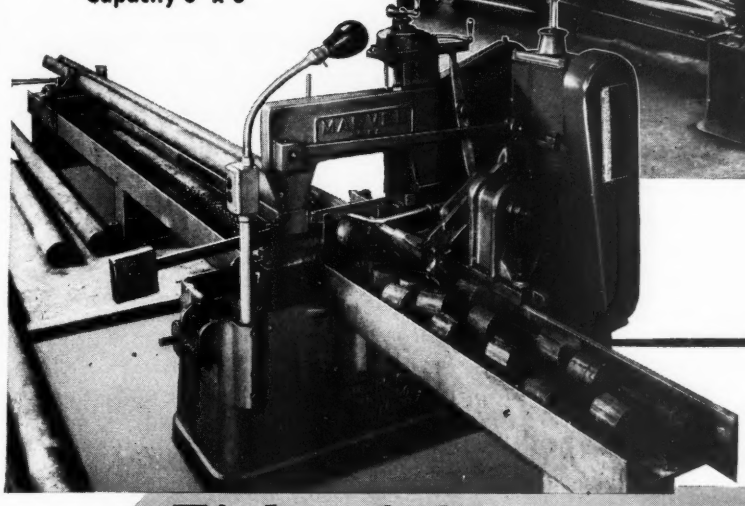
In October brass mills will be allocated 56,667 tons of primary copper and scrap; copper wire mills will get the same; foundry and powder products makers will get 5147 tons . . . OPS is considering raising ceilings for the castings industry; gray iron and low alloy foundrymen have already been consulted and the other groups in the industry will be in the next seven days . . . Westinghouse Electric Corp. has signed with the CIO's IUE for increases ranging from 7½ to 13 cents per hour . . . American television set owners will spend $264 million in the next 12 months to replace burnt out tubes . . . Commerce Clearing House says state tax collections reached the alltime high of $9.8 billion in fiscal 1952 . . . NPAF-138, a new application form for special priorities assistance, is available from Commerce Department field offices.

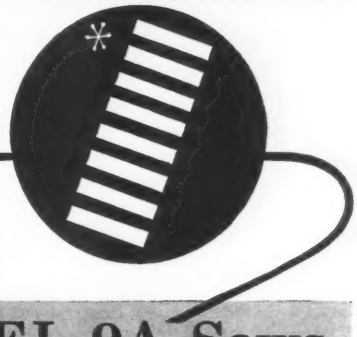
What Industry Is Doing

The coal market may decline in proportion to any price rise caused by the wage settlement (p. 47) . . . Our metals and minerals output may rise $1.1 billion annually in 1955 (p. 48) . . . Metalworking companies will lead industrial expansion in New England, says Arthur D. Little Inc. (p. 49) . . . Steel bar supplies are still tight although enough capacity exists (p. 50) . . . Producers of electric motor controls see new sales heights ahead (p. 51) . . . Final decision may come next February on materials decontrol (p. 58) . . . Market for industrial real estate widens as companies head for open spaces (p. 59).

No. 9A MARVEL
Production Saws
Capacity 10" x 10"

No. 6A MARVEL
Production Saws
Capacity 6" x 6"





Eight of these MARVEL 9A Saws

have already earned *Service Stripes**

Eight of these high speed MARVEL Production Sawing Machines at the Accuracy Steel Cutting Company, Hazel Park, Michigan, (a suburb of Detroit) operated almost continuously thruout the last war—cut up thousands of 20 ft. bars into accurate slices, pieces and lengths, for war production.

Now with a battery of fifteen of these world's fastest hack saws, Accuracy Steel Cutting Company has immense capacity to put behind defense and civilian work.

MARVEL Production Saws will automatically cut bar stock to size at terrific speed . . . they will feed, measure and accurately cut-off identical pieces from single or nested bars *automatically*, with no more operator attention than a battery of automatic screw machines.

Versatile, as well as accurate and fast, these saws can be stopped at any point in a production run—a miscellaneous cut made —and production resumed by simply re-engaging the automatic bar push up.

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MARVEL *Metal Cutting* SAWS

Better Machines-Better Blades

ARMSTRONG-BLUM MANUFACTURING CO.

5700 Bloomingdale Avenue *"The Hack Saw People"* **Chicago 39, U. S. A.**

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under 24" wide, and especially 12" and narrower

You'll save by buying STRIP

COSTS EXTRA MAN-HOURS IN MAKING

Cold Rolled Steel Strip may cost a little more in cents per pound than other flat rolled low carbon steel products. *The reason is in the extra man-hours required to produce it.* These extra man-hours are expended in meeting the stricter manufacturing standards that govern strip gauge, temper and finish.

SAVES EXTRA MAN-HOURS IN USING

But if your work calls for STRIP,* then the little you pay extra for it is more than offset by the extra man-hours you save in its use. This, with the other satisfactions it offers, lets you come out ahead with lower unit costs and with more sales-appealing goods.

DEPENDABLE DAN
T.M. REG. U.S. PAT. OFF.

*STRIP must not be confused with "SH-RIP"—our new word for sheet steel that happens to be cut into strip widths, in coils or otherwise. Ask any Reliance "Dan" to explain the extra service-potential of DSC STRIP.

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Standard and Production Sizes or Cut to Actual Working Dimensions

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Crusading Spirit

Circumstances which last week thrust Sen. Richard Nixon into the limelight of national attention so dramatically should be of interest to metalworking executives for two reasons. First, as frequent contributors to the expenses of candidates for public office, they have a direct concern in how their money is used. Secondly, as donors of millions of dollars annually to the anti-Communism activities of scores of organizations they have an interest in knowing that their money is spent wisely.

The Nixon case bears directly upon the first type of contribution and indirectly upon the second. The mere fact that the propriety of using contributed funds for certain purposes not only by Senator Nixon but also by some other current and former candidates has been questioned sharply suggests that the rules pertaining to political contributions and expenditures should be clarified so that a man of modest circumstances can run for office without embarrassment.

The anti-Red issue enters into the Nixon case because of his prominent role in the Alger Hiss conviction. When Congressman Nixon became interested in the feud between Whittaker Chambers and Alger Hiss, everything was running in favor of Hiss. The Chambers evidence against Hiss had been called to the attention of President Roosevelt by Adolf Berle, Walter Winchell, Ambassador William Bullitt and others. FDR had laughed it off as inconsequential. Supreme Court Justices Felix Frankfurter and Stanley Reed had been character witnesses for Hiss at his first trial. The State and Justice Departments were almost openly backing Hiss. President Truman referred to the Hiss business as a "red herring." All the anti-Communistic organizations were busy fighting Communism at the grass roots level. Only a handful of persons seemed to be interested in removing Communists from high places in government.

Among these few was Richard Nixon. According to Whittaker Chambers, it was he more than anyone else who was responsible for convicting Hiss.

Doesn't this suggest that businessmen, aside from backing legitimate anti-Communistic organizations, also should place great emphasis upon supporting men, like Richard Nixon, who have the crusading spirit to oust Reds from high government posts?

E. L. Shaner

EDITOR-IN-CHIEF

NOVEL IDEA PAYS OFF: Raising the inlet temperature of a jet airplane engine from 1500 to 2300 degrees F would triple its power. Naturally this possibility is a challenge to metallurgists to develop materials that will stand higher temperatures and resist wear. To date one of the most promising responses to this challenge is the new cemented titanium carbide,

called Kentanium (p. 76), developed by Kennametal Inc., Latrobe, Pa.

Almost as spectacular as the properties of the metal itself is the method by which it is produced. A major problem is to achieve uniform density in the material. After experimenting with numerous techniques, Kennametal came up with the novel idea of packing the ingredients of the carbide in rubber pouches, placing them in the chamber of an old 14-inch coast defense gun, introducing a liquid into the chamber, closing the breech block, and exploding a powder charge electrically. The result is a titanium carbide of uniform density and possessing characteristics which promise to meet some of the most exacting requirements of jet turbine blades and nozzle vanes.

* * *

TO WIDE OPEN SPACES: Industrial real estate is in the throes of a profound change. Older multiple story plant buildings in congested areas are a drug on the market. Today the trend is definitely toward rambling, ranch-style plants out in the fringes of metropolitan areas or in small communities quite distant from big cities. The accent (p. 59) is on space and convenience of transportation and parking.

This is a wholesome movement. Its end result will be improved working conditions for employees, economies for the employers and advantages to the community. Concurrent with this exodus of plants from crowded city streets to the outskirts is a disposition to move central offices from skyscrapers to park-like estates in the country. Watch this trend carefully; you'll read of important developments in the near future.

* * *

REALISTIC STATISTICS: Anybody who uses statistics more or less regularly knows how easy it is to misinterpret them. Every conscientious economist strives to work with statistics that are realistic. One of the safest methods of using statistics is to relate costs in terms of buying power.

For instance, you can sidestep a lot of futile quibbling when you can say to a North Dakota farmer that today he can buy a Studebaker Champion with the returns from 731 bushels of wheat (p. 61), whereas in 1941—11 years ago—he would have had to sell 890 bushels of wheat to pay for a Studebaker that was inferior to the current model. You can make the same point when you show that the employee in a manufacturing plant works 10 per cent fewer weeks to buy today's car than he did 12 years ago.

* * *

WHAT PRICE SOCIALISM: Under the auspices of the Anglo-American Council of Productivity, more than 900 representatives of British industry have visited plants in the United States during the past four years to observe American methods. Now that the program has been completed, what are the results?

Some ideas gained in this country have been put to profitable use. For instance, a number of British companies report increases in output of as much as 30 per cent through improved methods of handling materials. But the final report of AACP has one disturbing note. It points to two factors in American productivity (p. 57) that do not seem to be exportable. One is the American competitive spirit to make a profit. The other is the ambition of the American employee to better his lot in life.

Can it be possible that the heavy hand of socialism has dulled British initiative to that extent?

* * *

REARRANGEMENT DID IT: Sometimes it is amazing how a simple rearrangement of components will improve a product. For years wire cables on hot metal cranes consisted of 6 x 19 and 6 x 37 round strand rope with either fiber or independent wire rope core. The life of such a cable under the exacting conditions in an average steel plant was about a year.

By arranging the individual wires in each strand in a keystone shape instead of in a round shape (p. 104), four wires instead of one in each strand contact the sheaves. Also the core is smaller, so that actually there is 10 per cent more metal in the cable. Ropes of this flattened strand construction have served two or three years and in one plant a rope handled 1,800,000 tons of steel in four complete years of service. Although it still looked good, it was replaced on general principles.

Call Ryerson

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Steel procurement is trouble enough these days without adding unnecessary steps. That's one reason why many shops are ordering tool steel from Ryerson, their regular warehouse steel source. And with every shipment of Ryerson tool steel you get exact instructions on how to harden. Water, oil and air hardening types in stock—also ground flat stock.

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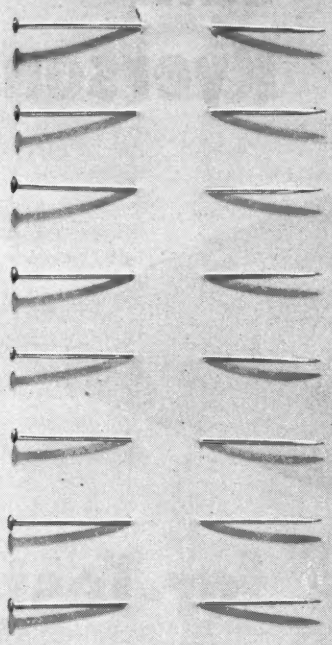

Fabricators looking for
shipment-to-shipment
STEEL UNIFORMITY
have found it at
Inland.
The reason:
Raw materials come
from the same sources
and finished products
are rolled on the
same mills
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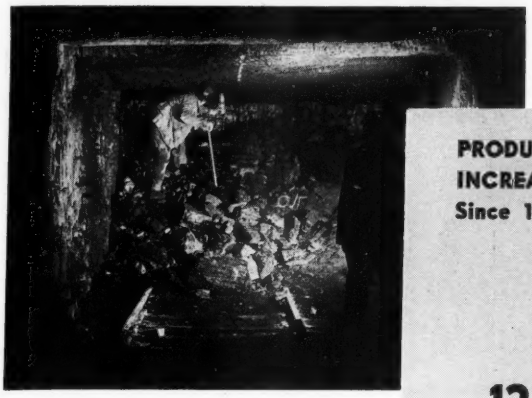
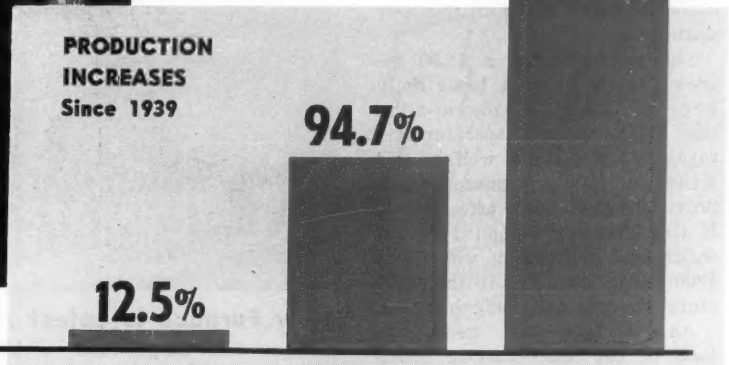
UP GOES COAL, but . . .





	COAL (millions of tons)	CRUDE OIL (millions of barrels)	NATURAL GAS (billions of cu. ft.)
1935-39 Average	400	1171	2313
1950	512	1972	6124
1952*	450	2280	8157

* Estimated

The Heat's on Coal

Bituminous prices begin to rise, and the market for the fuel may decline proportionately. The time has come to take a new look at fuels from all angles

TAKE A NEW look at the fuels situation because coal prices will be going up. The new wage pact John L. Lewis negotiated with the Northern operators boosts costs nearly 40 cents a ton.

Rising coal prices, the uncertainty about continuous mining operations and greater convenience of other fuels—all those factors and more have combined to increase immensely the production of oil and natural gas; while soft coal output, as seen in the accompanying table, goes up, but just enough to hold its own with the population growth.

What It Means—The matter of your own fuel bill isn't the only reason you should take a look at coal, gas and oil. The marked change in relative positions could mean new markets for you. What can you make for the gas production and distribution industry which will spend $5.6 billion on capital expansions from 1952 through 1956? What can you make for the oil industry which will spend even more? The coal industry will modernize, too, in the next five years, and even expand, but business opportunities resulting from its capital expenditures don't appear as promising as from the other two fuels.

The changing relationship among the fuels also means changing markets for equipment that uses them. As recently as 1948, annual unit sales of domestic warm-air furnaces for gas totaled about 188,000; for oil, 190,000; for coal and other solid fuels, 398,000. This year those figures are running 300,000 for gas, 240,000 for oil and only 60,000 for solid fuels.

The Edge—Coal long held the edge as fuel because of its low price and its availability. It has lost some of its charm on price, but not nearly as much as might be expected. Since 1939, Bureau of Labor Statistics figures show coal prices have risen about 88 per cent, but oil has risen 117 per cent. Gas is THE fuel from a price standpoint because it has risen only about 11 per cent. Coal can compete on cost with oil, but not gas, in many heating applications.

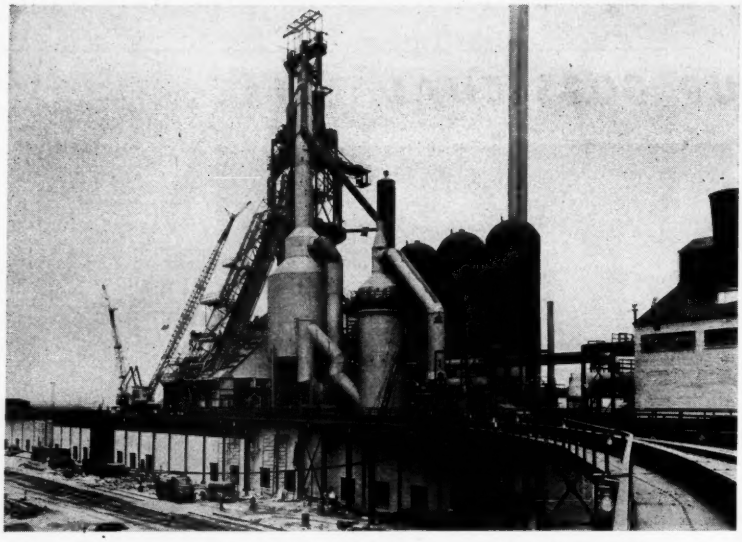
Coal no longer has much advantage on the availability score, now that gas and oil can be distributed almost anywhere at a cost comparable with the distribution charge for coal. But Old King Coal is still supreme in many applications—power generation, coking, large-scale industrial heating to mention a few.

The Hand of Mr. Lewis—Yet the list is dwindling, partly because of Mr. Lewis' activities, the North-

ern operators who agreed to the latest terms have already said they'll probably need a price hike. They may not have to get a new price ceiling because about a month ago when the last comprehensive price figures were available the average bituminous coal quotations were about 60 cents below ceiling. Northern operators need about 40 cents to cover costs of the new settlement.

The pact provided a $1.90 increase in the present basic daily wage of $16.35, a 10-cent-a-ton rise in the 30-cent operator-paid royalty to the UMW welfare and retirement fund and miscellaneous provisions that don't affect costs. If the formula is applied to the entire coal industry, it would add $300 million annually to the operators' charges for doing business.

As of late last week, details of the miscellaneous provisions were not known, but they were thought to represent management concessions on such matters as the legal liability for action of members.



New Furnace Is Latest Addition to Steel Family

National Steel Corp.'s family of blast furnaces reached 12 with the addition of twins—this Zug Island, River Rouge, Mich., plant of Great Lakes Steel Corp. and a similar furnace at Weirton Steel Co., Weirton, W. Va. The new arrivals will add about 1,000,000 tons per year to the pig iron capacity of National Steel. One of the largest furnaces National Steel has built, this Zug Island plant is equipped for high pressure blowing. Construction of the furnace required 5500 tons of steel and 11,300 cubic yards of concrete

Metals Expansion: Billion Dollar Teamwork

Program to help private industry increase the output of certain metals and minerals is one year old. Here's a progress report with goals for some metals by 1955

METALS and minerals production will be upped by about $1.1 billion a year in 1955 through joint government-industry expansion activity. "Real progress" has already been made in that direction, says Howard I. Young, deputy administrator, Defense Materials Procurement Agency.

To date, DMPA has programs to expand production of 17 metals and 22 non-metallic minerals. Four metal programs and nine non-metal programs are complete. Also, 11 metals and eight non-metals programs are between 70 and 100 per cent complete.

On the Way — Government assistance comes in several forms: Purchase contracts, advances against production, tax amortization certificates, maintenance-of-production contracts, aid in building access roads and like operations. So far, DMPA has received 1882 applications for government assistance of one form or another. Of these, 430 were withdrawn, 671 denied and 469 applications are approved and in effect. The remainder are still in negotiation.

The above approved projects do not involve cases of aid in getting machinery and equipment under the controlled materials program. In that category, DMPA has approved some 500 projects.

DMPA Targets—Just what are the goals for various minerals by 1955? Mr. Young says: **Beryllium** production will be up 70 per cent through purchase and resale contracts, loans, geological investigations, process development in ore dressing and various hydro-metallurgical studies. Plans for concentration of beryl on a commercial scale are in the works also. **Copper** production should be up 25 per cent through expansion and increasing production at existing plants. **Fluorspar** production will be increased 50 per cent by 1955. **Iron Ore** production will be up approximately 40 per cent by 1955 largely through issuance of tax amortization certificates. Supply of **Manganese** is expected to increase 30 per cent through fuller use of domestic ores and added imports. Foreign purchases and establishment of domestic buying stations should up the country's supplies of block and film **Mica** by 50 per cent. **Molybdenum** production will go up 130 per cent partially through commitment-to-purchase contracts. Supply of **Nickel** should be increased about 35 per cent through purchase contracts, loans, tax amortization certificates and reactivation of the government-owned Nicaro plant in Cuba. **Tungsten** supply will be expanded by 190 per cent in 1955. Production of **Zinc** is expected to increase by 15 per cent. While subject to rapid and major changes, present plans for **Titanium** output in 1955 call for quantities several times the present plant capacity. The **lead** program calls for an expansion of only 2 per cent by 1955.

Metalworking Slated for Bigger Role in New England

BLUEPRINTS for future industrial progress in New England emphasize the fast-growing metalworking industry, soft pedal the textile and nondurables industries.

That's the tenor of a report by Arthur D. Little Inc., Cambridge, Mass., prepared for the Federal Reserve Bank of Boston. Right now it's just a gleam in the eye of the statisticians, but the dynamic growth of metalworking industries in New England since 1939 makes possible a long list of opportunities for industrial expansion.

Particularly high on the list of needed expansion is more district steel production. Growth in steel consumption has been made despite freight disadvantages of from $9.45 to $12.20, and today New England is a deficit area in specialties steel output, a surplus area in scrap production.

Wanted: Investor—That situation means that while the proposed $228-million integrated mill near New London, Conn., is a dud, construction of a smaller specialty bar mill with an annual capacity of 140,000 tons is warranted. The plant would produce billet-sized ingots from electric furnaces utilizing an all-scrap charge. High carbon, alloys and tool steel bars and bar shapes would be rolled.

Cost of the mill would be approximately $14 million, of which $11 million is required for machinery and equipment. Finished steel could be produced at about $71 per ton. Total market for alloy bars is in excess of 122,000 tons annually and carbon bars run 375,000 tons. About 240,000 tons of carbon steel bars are consumed within a 50-mile radius of Boston. The mill would avoid stainless steel, cold-rolled strip and wire production in which supplies generally are adequate.

Pilgrim's Progress—That's just part of the modern industrial pilgrim's future. Here are a few of the other areas ripe for investigation and expansion:

Aluminum: It is recommended that New England ports be studied for the possible establishment of facilities to separate alumina from bauxite to serve the heavy requirements of nearby reduction plants in New York state. Since aluminum metal is available by water from Gulf ports and by rail from nearby points, it is also recommended that consideration be given to establishment of new fabrication plants for primary shapes.

Atomic Energy: High relative cost of electricity in New England makes desirable the study of production of electricity from atomic reactor units. Lower cost would stimulate industry to move into the area, boost sales of electric appliances for home use.

Cutlery, Hardware: New England supplies one-fourth of the nation's output. Production can be further increased by increasing the diversity of lines.

Machinery: The manufacture of nonelectrical machinery is the second-ranking industry in New England. With a shift in industrial growth to newer industries, such as electronics, the machinery industry can adapt itself to this new market if it continues to grow.

Titanium: The possibility of New England for the location of a reduction plant is feasible if the Kroll process proves successful. New England is strategically located with respect to ore deposits at Sorel, Que., and the future of the plant would be as broad as that of titanium itself.

Transportation: One of the more rapidly growing industries of New England, aircraft and auto parts manufacturers are finding greatest opportunity at present. Construction of an atomic powered submarine by the Electric Boat Division of General Dynamics Corp. could have a tremendous impact on the future of shipbuilding.

Backbone: Men—Men are the outstanding feature of New England's resources, concludes the report. The method best calculated to harness material and human resources for the development of New England is systematic technical and economic research.

H-R Steel Bars: More Capacity Needed?

Some people say we do, but capacity is double the output. The pinch comes from concentration of military demand, lack of steel and low profit in bars

DO we have enough hot-rolled steel bar capacity?

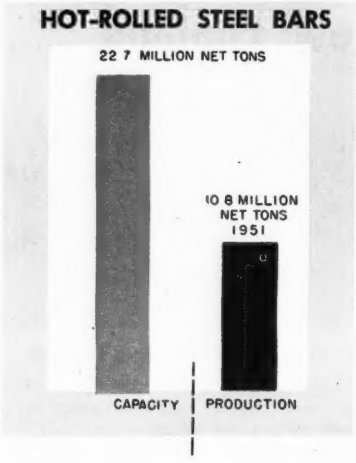
No steel product is in any tighter supply than bars, particularly those over one inch in cross section. Much of this heavy demand for bars stems from the military program.

From time to time you hear that "what this country needs is more bar capacity."

Enough?—Maybe we don't need more hot-rolled bar capacity. In 1945 when the American Iron & Steel Institute reported steel finishing capacities on a maximum annual potential basis, without relation either to available supply of ingots or to actual performance in production, it showed that this country's hot-rolled bar capacity was 22,685,360 net tons. Since then the capacities shown are related either to available supply of ingots or to actual performance; and the total is lower, the 1951 hot-rolled bar capacity being listed as 14,548,230 net tons.

A Lot of Room—The consensus is that hot-rolled bar capacity is about the same as it was in 1945. If the mills could roll 22.7 million tons of hot-rolled bars, there is little question that this amount would far more than suffice. Production in 1951 was only half that amount, 10.8 million tons. That there is capacity not now being fully utilized is borne out by reports that some bar mills are operating only a part of each week. If that is because they lack steel they should find some relief in the expansion of the nation's ingot capacity (see STEEL, Sept. 22, 1952, p. 82).

Bar to Production—A deterrent to channeling a lion's share of the additional steel into the bar mills is the low profit from hot-rolled bars. Nevertheless, the steel industry is directing an increasing percentage of steel into the bar mills. In the first half of 1952, hot-rolled bars comprised 14.5 per cent of all mill shipments of finished steel. For all of 1951 the rate was 13.7 per cent. In 1950 it was 13.4 per cent.



Some of the problem of supplying the bar demand comes from the concentration of the military demand within a certain range of sizes.

The bar shortage will get further attention next Wednesday when the Carbon Bar and Semifinished Steel Industry Advisory Committee meets with the NPA in Washington.

Castings Output Stays High

Steel castings production will hit near-record levels for the second straight year, the Steel Founders' Society of America was told at its annual meeting in Hot Springs, Va., by its executive vice president, F. Kermit Donaldson. A large proportion of the high output is going for military requirements. Conservative estimates place at least half of all defense production dependent on steel castings.

The steel castings industry is now producing at only slightly less than the 1951 rate, when shipments totaled 2,050,054 tons, despite the steel strike, says Mr. Donaldson. According to STEEL's figures, six-month shipment totals were 1,084,600 tons of steel castings in 1951 and 1,022,300 tons in 1952. In 1950 the year's total was only 1,461,000 tons. Alltime high shipments came during the wartime production of 1944 when 2,445,000 tons were shipped.

Conservation and advanced production techniques effected through various research and development programs were stressed by H. A. Forsberg, president of Steel Founders' Society and vice president of Continental Foundry & Machine Co., East Chicago, Ind. Development of cast steels has greatly increased demand for cast armor hulls, turrets, transmission cases and other components for tanks and armored vehicles. Increasing quantities of cast steel parts are needed for the atomic energy program.

U. S. Cobalt Allotments Up

Though the International Materials Conference, due to reduced needs of other participating countries, is expected to increase the cobalt allocation to the United States for fourth quarter, little likelihood is held out for more cobalt for domestic consumption.

The increased allotment is slated to go largely into the nation's stockpile. Only slight easing in restrictions on cobalt for civilians is predicted for the immediate future.

From a long-run viewpoint, however, the supply situation is expected to ease as a result of opening up of three new sources—one in Mexico and two in the United States.

Freight Car Deliveries Decline

While August deliveries of new freight cars declined from the July totals, shipments of new locomotives are on the upgrade, the Association of American Railroads announces.

Freight car deliveries suffer from inventory shortages due to the recent steel strike. August shipments of 4537 contrast with 7183 deliveries in August, 1951. The backlog of cars on order and undelivered reached 95,761 as of Sept. 1.

New locomotives delivered in August, 1952, total 210. The sum for the first eight months of this year is 1703, comprising 2188 pow-

er units. Figures for last year show 164 locomotives consisting of 2283 power units delivered during the first eight months.

Trolley Coaches Hit the Road

Trackless-trolley makers are sighting broadened market possibilities. Indications are that sellers of the vehicle may ring the bell in foreign markets, particularly in South America.

Increasing the value of trolley coaches is their durability record. Some 97 per cent of coaches purchased since 1930 are still in operation. Simplicity of equipment makes for low maintenance cost.

The use of trolley coaches is growing rapidly. On Jan. 1, 1952, there were 7065 in operation in 41 cities. Of this number, 4314 were produced in the post-war period.

In the foreign market field, South America's power situation plays into the hand of trolley coach manufacturers. Many countries south of the border import most of their liquid fuels. Electric power can be generated cheaply from coal or local waterpower. Hence the electrically-driven trolley coach may be a natural for the Latin countries.

Westinghouse Ups Production

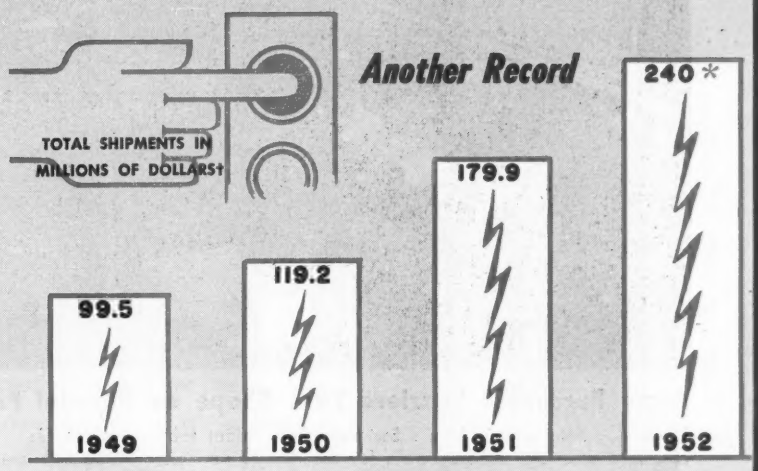
Westinghouse Electric Appliance Division at Mansfield, O., will step up production by 25 per cent or better within the next three months. Production at the division's Springfield, Mass., plant will expand about 20 per cent.

Employment by Dec. 1 is expected to reach the 7500 mark at Mansfield. The Springfield plant estimates it will have 4000 employees by that time.

Hiring of new employees began recently at Mansfield to build up dwindling supplies of refrigerators, ranges and other electric housewares. New employees are now being hired at the Springfield division which makes refrigerator units, food disposers, fans and vacuum cleaners.

A sharp climb in appliance sales since July, in addition to good middle-year sales, is expected to bring the appliance division's total sales billings to equal or exceed their 1950 record year.

INDUSTRIAL MOTOR CONTROLS:



* Estimated by STEEL.
† Includes both manual and automatic control equipment.

Expansions in electric power and capital goods have carried electric motor controls up to new heights in sales, and control makers look to new industries to continue the trend

THERE'S only one way to go—up. That's the way electric motor control makers are thinking despite signs pointing to a leveling off.

Motor control men base their optimism on two things: Newly expanding markets and refinements of present controls which will antiquate older designs.

What's Up — Industry looks to electric motor controls as the equipment which regulates speed of machinery and flow of electric current, automatically starts and stops machinery and for precise, quick, automatic control of production operations. The steel industry and manufacturing plants take the top share of output. Machine tool industries, the automakers, the rubber industry take a good portion, too. The petro-chemical industries have been an up-and-coming customer and are expected to become an even larger one.

Riding the crest of capital goods sales and needed to control the added power from the electric power expansion program, dollar sales of electric control manufacturers have been hanging up new records each year and will do it again this year with a probable $240 million sales volume (see chart).

Switching Over — With many capital goods expansion programs nearing or at completion and electric power expansion stretched out, won't the control industry level or dip now? No, say control makers. New applications are needed in the petro-chemical industry. Coal hydrogenation, atomic energy, TV, and frozen food industries will more than take up any slack in the normal markets. Trend toward automation will give an added boost to controls' sales.

Among recent technical developments, expected to open both a new and a large replacement market, are longer-life starters, magnetic amplifiers, control for ac motors to provide adjustable speeds, and packaged drives, making the control an integral part of the power supply. The aim is to simplify the controls themselves, reducing the need for highly-skilled operators. Very complicated electronic controls have a somewhat limited market simply because qualified operators are hard to find.

Finally, foreign markets which have fallen off in the past year are due for concentrated attention in the near future. Right after World War II, exports jumped way out of normal proportion and a large replacement market now waits exploitation as soon as domestic orders can be caught up.

Army Personnel Carriers Take Shape on Parallel Production Lines

Production lines at U.S. Steel's Berkeley, Calif. plant fabricate and assemble armored hulls for the Army's new personnel carrier. At the left, two parallel lines are shown, each capable of accommodating 18 fixtures holding as many hulls. Elevated platforms allow easy access to the assemblies. At the right, varied shapes are traced by magnetic mechanisms guiding four oxy-acetylene torches working simultaneously. Most of the hull's components are flame cut, shaped and finished at the Berkley plant. The assembled hull is made up of seven major sub-assemblies

Small Firms Prepare for Distant Defense Lag

WHAT IS your correct proportion of defense and civilian business?

This question is coming up more frequently. Small companies are paying more attention to this problem, although national security spending in the next 12 months should reach $58 billion, then level off. It's the leveling off that has some manufacturers thinking; they remember the hard times which hit many small defense producers at the close of World War II. They aim to hold their own in the competitive civilian market, despite many defense orders.

No one can supply a formula which reveals the correct defense-civilian output ratio for all industries or companies. Defense is now taking about 33 per cent of the average manufacturer's turnout, but only 17 per cent of General Motors Corp.'s production. Small firms, however, often carry larger percentages of defense work. These companies are more and more attempting to keep defense and civilian orders in balance. A case in point is Gunderson Bros. Engineering Corp., Portland, Oreg. Officials of this plate fabricating and construction company are saying that they are still accepting numerous civilian jobs, despite a large backlog of government orders.

Right now, most small companies are still not getting enough government contracts, according to some federal officials. In a parting shot before resigning as chief of Small Defense Plants Administration, Telford Taylor lambasted the Armed Forces procurement officials. He suggested that Congress should see to it that small companies get a larger share of defense work, if small business awards are not stepped up. Eventually SDPA may have the power to actually award contracts.

Awards in excess of $100,000:

PRODUCT	CONTRACTOR
Shells, Mortar	Motor Wheel Corp., Lansing, Mich.
Parts for Shells, 60 mm	Motor Wheel Corp., Lansing, Mich.
Steel Cartridge Clips	L. E. Zurbach Steel Co., Somerville, Mass.
Cab Chassis for Trucks	Reo Motors Inc., Lansing, Mich.
Aircraft Parts (6 Contracts)	United Aircraft Corp., E. Hartford, Conn.
Carburetor Assemblies	Bendix Aviation Corp., Detroit
Controller Assemblies	W. L. Maxson Corp., New York
Engine Parts	Westinghouse Electric Corp., Pittsburgh
Aircraft Maintenance Parts	Douglas Aircraft Co., Santa Monica, Calif.
Crystal Units	Perfection TV Mfg. Corp., Bronx, N. Y.
Parts for Generator Sets	Gremco Inc., Ft. Worth, Tex.
Switchgear Equipment	General Electric Co., Schenectady, N. Y.
Repair Parts for Pumps	Buffalo Pumps Inc., Buffalo
Steel Desks	Globe-Wernicke Co., Cincinnati
Utility Tables	Victory Metal Mfg. Co., Philadelphia

NPA Leases Machine Tools

The National Production Authority intends to lease 30,000 government-owned machine tools to deserving military and defense-supporting contractors.

The equipment consists of tools purchased by the government during World War II and loaned to military contractors. NPA estimates its value at $450 million. Since the war the tools have been gathering dust in scattered storage depots and arsenals.

NPA has organized teams of process engineers to canvass major metalworking plants in order to locate idle tools. The teams report to PECIG (Production Equipment Central Inventory Group) in Washington.

Military contractors wishing to lease production equipment must submit written requests to their military contacting officer who will judge the request.

Blast Furnaces Show Recovery

Blast furnace production, showing recovery from the steelworkers' strike, totaled 5,830,757 net tons in August, the American Iron & Steel Institute reports.

To attain that tonnage, furnaces operated at 93.3 per cent of capacity.

Production this year through August totaled 36,742,311 net tons.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administration Services Division, Temporary E Bldg., Washington 25.

Materials Orders

CRYOLITE—Amendment of Sept. 18, 1952, of NPA Order M-99 permits all users of cryolite, except producers of primary aluminum and insecticide-grade cryolite, to use up to 125 per cent of their actual first quarter, 1952, consumption of cryolite in any calendar quarter starting with the fourth quarter, 1952. These users also are allowed a 45-day inventory of cryolite. Amendment will be effective Oct. 1.

GRAPHITE, CARBON ELECTRODES—Revocation on Sept. 22, 1952, of NPA Order M-66 and Direction 1 allows consumers to purchase graphite and carbon electrodes in the open market within the limits of present inventory regulations without further government control.

ALUMINUM SCRAP—Amendment of Sept. 24, 1952, of NPA Order M-22 eliminates the requirement that owners or generators of aluminum scrap file Form NPAF-152 with NPA when making deliveries of 20,000 pounds or more of such scrap. It was effective Sept. 24.

Price Regulations

RESELLERS—Amendment 13 of Supplemental Regulation 29 of the General Ceiling Price Regulation makes available to GCPR resellers the "first-in, first-out" (FIFO) inventory method of pricing and permits certain resellers, under stipulated conditions, to make simultaneous price changes in all their sales outlets, based on categories or product lines rather than on individual articles. It was issued Sept. 22, 1952, effective Sept. 27.

REFRACTORY PRODUCTS—Amendment 1 of CPR 125, issued and effective Sept. 23, 1952, authorized an industry earnings standard increase of 5 per cent in ceiling prices for manufacturers of a wide range of refractory products.

TUNGSTEN CARBIDE—Supplemental Regulation 1 of CPR 71, issued Sept. 25, 1952, and effective Sept. 29, establishes a method of ceiling price relief for certain manufacturers of mixed powders used in the production of sintered tungsten carbide products.

COMPETITIVE ARTICLES—Supplemental Regulation 33 of CPR 22, issued Sept. 24, 1952, and effective Sept. 29, establishes a method by which manufacturers who, during their base period, introduced a product at a price substantially below the price of similar competing products may apply for increases in their present ceiling prices.

Canadian Controls Curtailed

Semi-fabricated copper and aluminum buyers in Canada no longer need permits from the Defense Production Department before placing orders with the mills. The decontrol affects ordering of copper wire, wrought copper, copper alloys and aluminum shapes. Not included are primary copper and aluminum or imports of semi-fabricated forms from the U. S.

Easing of controls is possible because of a slackening of production pressure at the mills.

Renegotiation Reports Due

Defense contractors whose fiscal years end on June 30 are being reminded by the Renegotiation Board that the first part of their renegotiation report, RB Form 1, must be filed with the board by Oct. 1.

Second part of the report, RB Form 1B, may be filed simultaneously with Form 1, but must be filed not later than 60 days after Oct. 1.

Under the Renegotiation Act of 1951, all defense contractors and subcontractors having income from renegotiable contracts — including brokers, agents and dealers—must report regardless of the amount received. Those with total income from renegotiable sales of $250,000 or less will not be renegotiated but they must file answers to a portion of Form 1.

Floor figure for brokers, agents and dealers is $25,000. However, contractors having less than the minimum income from renegotiable sales will not be required to file the more detailed Form 1B.

Forms may be obtained from the regional Renegotiation Boards in Los Angeles, Chicago, Washington, Boston, New York, and Detroit, or from the Renegotiation Board in Washington.

NPA Loosens Pig Iron Limit

Exceptions to the 30-day inventory limit on pig iron are being permitted by NPA's Iron and Steel Division.

To encourage efficient operation of blast furnaces NPA is allowing uninterrupted runs on special grades of iron. Thus, requirements of special analysis irons in some cases are being anticipated for several more months to come.

The foundries accumulating excess stocks of special grades are not permitted to build up stocks of the regular grades. From the standpoint of balance, therefore, 30-day inventory limit is observed.

Latest reports from consumers to NPA show the pig iron melt is increasing, with biggest gains by the automotive and soil pipe foundries. The only substantial downward trend is in the melt for machine tool castings. Reports from the blast furnaces show that they are meeting all their pig iron obligations, but have nothing left over.

John Horne is SDPA Chief

John E. Horne, the new small defense plants administrator, is a charter member of the organization. He served as administrative assistant to the chairman of the Senate Small Business Committee for five years before becoming deputy SDPA administrator on Nov. 7, 1951. In this capacity he planned and developed agency policies in Washington and in the field

Appointments in Washington

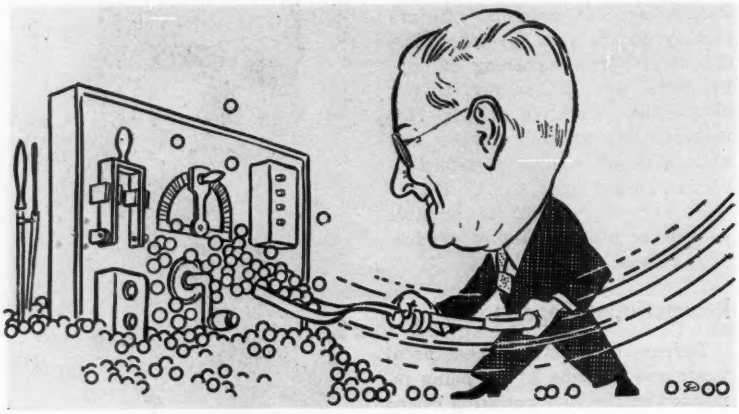
Earle L. Slayton, formerly assistant to the president of Cherry Burrell Corp., Chicago, was appointed director of the General Industrial Equipment Division, National Production Authority.

W. H. Bennett, Hydraulic Press Mfg. Co., Mt. Gilead, O., was appointed chief of the Forge & Press Section, Metalworking Equipment Division, National Production Authority.

Joseph A. Doyle Jr., Wm G. Wetherall Inc., Baltimore, was named chief of the Warehouse Section, Iron & Steel Division, National Production Authority.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*



SAWYER TO MOTHBALL CONTROLS
. . . but he'll keep the shovel handy

Although the Controlled Materials Plan will probably end by mid-year 1953, many NPA agencies will be drawn back into the Commerce Department and held for emergencies

WITH THE DEMISE of the Controlled Materials Plan tentatively slated for no later than next June 30, Secretary Sawyer is hard at work on plans to mothball units in the present National Production Authority which should be retained to serve as a nucleus around which to build another NPA should a future emergency require and to serve as the government's front for rendering services to civilian industry.

The plan, not worked out yet in detail, calls for preservation of the various industry divisions. Some of these are to go in a new Commerce unit, the Bureau of Production and Distribution. To provide the framework for others, the old Bureau of Foreign and Domestic Commerce may be revived. Mr. Sawyer says he will recommend a plan to the President by Dec. 31 for retaining those NPA services which will continue to have value. In the meantime he proposes to effectuate a Commerce reorganization which will serve as the basis for making that plan effective.

Rash Motive—Reason for this speed in shaking up the Commerce Department is the decontrol rash which has broken out in virulent form because of the rapidly easing situation in the master metal, steel. Producers have made a much faster comeback from the steel strike than expected, new facilities in the expansion program will be coming into production on a rising scale and new demand is down.

That raises the question: Why 100 per cent controls over steel, copper and aluminum when priority demands involve no more than perhaps 20 per cent which could be taken care of by retaining present priority ratings without CMP?

Inhibitor—A Commerce official points out the CMP serves as a brake to normal business expansion, so it should be removed at the earliest possible moment to enable business and industry to carry out expansion plans necessary for high levels of civilian business.

It was the outlook for early termination of the CMP and substantial reduction in the NPA work burden that led to appointment of Horace B. McCoy as deputy NPA administrator. Mr. McCoy, a Commerce career man, is the logical candidate for the job of fitting into the permanent Commerce organization those parts of the NPA which are to be perpetuated.

Armour Manganese Probe . . .

To pave the way for action by the steel industry in salvaging the manganese content in slag from open-hearth furnaces operating on manganese-bearing lake iron ore, the American Iron & Steel Institute recently effected arrangements whereby the Armour Research Foundation will investigate a number of proposed chemical leaching processes for extracting the manganese.

In the meantime, AISI is continuing its financial support of the work being done at the Bureau of Mines' experimental stations at Pittsburgh and the University of Maryland to develop a metallurgical process for converting this manganese into commercial-grade 80 per cent ferromanganese.

For Industrial Hams . . .

The Federal Communications Commission's "List of Equipments Acceptable for Licensing," (for use in the public safety, industrial, and land transportation radio services) is to be released in January. In addition, the commission has adopted new rules providing for gradual revision of the list as additional equipment qualifies.

The commission also has adopted FCC Forms 400 and 400A—to become available in January—for future use in applying for authority to install such radio services.

Salvaged Brass Pays Off . . .

Army Ordnance's metal salvage program is providing more than 75 per cent of the brass and other nonferrous metals it uses to make ammunition. The metal salvage program has saved the government about $37 million in the last 18 months, says Brig. Gen. Joel G. Holmes, former chief of Ordnance's ammunition production.

A major portion of the salvaged metal is from deteriorated and obsolete ammunition. Another large source of supply is fired cartridge cases and other components from the battlefields of Korea.

The Facts about
Power Axles for Fork Trucks
...and what they mean to you

IF YOU ARE a present or potential user of industrial trucks looking for the cheapest regardless of operating efficiency and long life, this message on power axles is not for you. It's written for those who "look under the hood" before each purchase and who rate each operating component in the light of knowledge and experience.

You don't have to be a gear specialist to evaluate power axles. Knowledge of the following simple facts is all you need.

Here's How They Work

The gearing in fork truck power axles transforms the high speed of the motor to lower speed and high power at the wheels. This necessary gear reduction is usually accomplished in one of two ways: spur or bevel gearing, with a gear train of two or more steps, and worm gearing in a single step.

Fork Trucks are Not Autos

Industrial truck drive systems are called on for punishing, heavy-duty service. Truck operation is comparable to driving an overloaded auto constantly in low gear. It has been shown that one month's wear and tear on an industrial truck transmission equals a year's on a passenger car.

The leading manufacturer of road truck axles who makes both types of drives recommends spiral bevel gearing "for most *medium* and *light*-heavy-duty applications", but calls the worm drive axle "the work horse of the West", for *heavy-duty* highway hauling.

Machinery Handbook virtually describes the requirements of industrial truck drives when it states: "Worm gearing may be employed (1) as an *efficient, steady* transmitter of power; (2) when a *large reduction in velocity* is desired; (3) when *considerable increase in mechanical advantage* is required, or in other words, when a given applied force must overcome a comparatively high resistance to motion."

Other characteristics of the modern worm drive which make it ideal for our purpose are (1) constant, positive transmission due to multiple tooth engagement and (2) smooth, quiet action due to a constant flowing tooth contact as contrasted with intermittent tooth contact in spur gearing.

Thus we see that while spur gearing is logically applied to high-speed, low-torque transmissions (as in passenger cars and light duty highway trucks) worm gearing is ideal for the low-speed, high-torque requirements of industrial trucks.

Efficiencies up to 97%

A common misconception existed for years that worm gearing was inefficient. This was probably started back in 1910 when it was said in mechanical engineering handbooks, "Worm gearing efficiency can never be as much as 50%." At that time gears were cut with straight sided teeth on grinding wheels, like coal furnace stoker feeds, the material being steel or cast iron.

But the development of new tooth profiles and further research changed the classic requirements for tensile strength. This permitted the use of polished, hardened nickel alloy against bronze—an ideal combination for low friction and high strength.

New lubricants further reduced friction losses.

Finally, the development of the highly efficient involute worm, providing rolling instead of sliding action approaching that of a ball in a race, gave worm gearing efficiencies equal to or greater than any other reduction system.

The important fact to remember is that worm gearing achieves the speed reduction required *in one step.* Alternate systems require at least two steps (for space economy and other reasons) thus compounding friction losses. A 90% efficiency for each reduction, for example, results in only 81% efficiency in a double reduction gear train.

One more point: Worm gearing does not lose efficiency with wear—you can readily see why from its inherent design. The worm continuously regenerates the "ideal" tooth profile on the softer worm wheel. The efficiency of spur or bevel gearing, on the other hand, gets progressively lower as teeth start to wear and lost motion develops.

Another Baker "First"

Walter C. Baker, a founder of the Baker-Raulang Company, gave the automotive industry its first drive shaft automobile in 1901, and in 1906 contributed the worm drive to street trucks and autos. In 1914 Rauch and Lang, who later merged with Baker, also adopted the worm drive. The first Baker industrial truck, built in 1917, used a worm drive, and it has been our standard drive ever since.

Automobile manufacturers dropped the worm drive in the early thirties in favor of cheaper, easy-to-mass-produce spur gearing, which is entirely adequate for passenger cars.

But our experience has convinced us that worm drive is best for industrial trucks because (1) it is cheapest to operate and maintain; (2) it has higher average efficiency than double-reduction spur drives; (3) efficiency is not affected by wear; (4) it delivers higher efficiency under heavy load, when maximum power is needed; (5) it is smooth and quiet in operation and (6) it outlasts all other drives.

Incidentally, the first Baker industrial truck is still in active service—still using its original worm-drive power axle with unimpaired efficiency—after 35 years.

For a copy of a new 8-page booklet on Baker features and equipment, write for Bulletin 54.

INDUSTRIAL Baker TRUCKS

The Baker-Raulang Co.
2059 West 80th St. • Cleveland 2, Ohio

for strong, tough ACSR cores

specify Pittsburgh Wire

Made especially for reinforcement of stranded aluminum electrical conductors, Pittsburgh A.C.S.R. Core Wire has the high-tensile strength, the toughness and the heavy uniform galvanized coating to enable you to make the best possible cable.

With this special wire, you get the benefit of the years of experience of one of the largest wire mills in the world. It has an inherent quality that stems from the selected high carbon, open-hearth steel—the uniformity of gage—and the tight adherence of coatings that will work flawlessly in your stranding and closing machines. Available in diameters 0.1878″ to 0.0525″. For information on how to order, write today to Department S, Pittsburgh Steel Company, Grant Building, Pittsburgh 30, Pennsylvania.

Pittsburgh Wire

a product of **Pittsburgh Steel Company**

Pittsburgh, Pa.

Black Star

Indonesia Takes to the Jeep

This jeep assembly line could be as American as the hotdog, but it happens to be in Indonesia. That Asiatic country must import all its automobiles from Europe and America. The autos come in pieces and must be assembled by native labor; therefore, several trade schools are maintained to train young men. They build not only standard models, but also custom-built jobs, mostly for government

U.K.-U.S. Productivity: Ideas Differ

British businessmen on productivity team visits here took home ideas on standardization, production flow, materials handling. Did they appreciate profit motive and worker?

AFTER four years have gone by, 500,000 copies of reports have been made, 911 persons comprising 66 teams have crossed the ocean and $1,467,425 have been spent, the Anglo-American Council on Productivity has made its final report. What are the results? Has any good been done?

Of course, there's no categorical answer to those questions. On the favorable side of the ledger can be placed a better understanding between American and British businessmen. A rustle of activity among British trade associations in organizing research and standards committees indicates the germ of a new idea has been planted in the U. K. A new appreciation of straight-line or continuous-flow production methods has taken hold in Britain, too.

Ways and Means — Generally, smaller British firms have benefitted most from the productivity program. Productivity reports have encouraged use of conveyors in light castings foundries, increased use of sand slingers in jobbing and heavy foundries and closer attention to servicing of moulders. British automotive plants have been encouraged to change plant layouts to maintain flow of work and there's a tendency for each firm to limit ranges of engine sizes, and job work is being segregated from batch production. The Materials Handling Report of the AACP has been a best-seller among the reports. Some companies relate as high as 30 per cent increased output without any additional labor through improved handling.

The iron and steel productivity report points to the integrated American works and the government-aided modernization of American plant and equipment as largely responsible for higher U. S. productivity. Other differences: "The perennial shortage of labor in relation to resources encouraged mechanization; the market is very large and highly standardized; and intensive competition has stimulated both the amalgamation of firms and investment in sources of raw materials."

Nonexportable — But, it's been dramatically pointed out by these productivity teams that the U. S. can not export two of the most fundamental differences between the production methods of the two countries. One is the American competitive spirit to make a profit. The other is the drive and ambition of the American worker to better his lot in life.

As one member of a British team put it: "An American will work very hard to send his child to college, though he himself never had that opportunity. Our worker would like to send his child to college but says 'Why should I kill myself to send him? Let him make his own way there.' "

Long Road Back for Germany

Orders for capital goods in Germany slumped, from the index of 191 in May to 167 in June (1949 = 100), for the first time in some years. That is not interpreted as the forerunner of a major decline, but as a reflection of special and heavy tax levies on capital goods. The German Machinery Makers' Association, in a study just published, discovered that one-third of all machine tools in Western Germany are more than 20 years old and 60 per cent were bought at least 10 years ago.

Other recent figures show Germany is far from independent of American coal in iron and steel production. Output figures below are for May, June, July, 1952.

Iron*		Steel*	
Total	Based on U.S. Coal	Total	Based on U.S. Coal
1179	292	1418	231
1117	330	1347	259
1219	330	1516	259

* Production in thousands of tons.

Turkish Roads Get Extension

Modern highway construction and maintenance in Turkey, begun more than four years ago, is being extended under the MSA as an important defense need. Most of the new financing—$2,655,000—will be used to purchase additional equipment, including graders, maintainers, crushers, a screening plant, dump trucks, bridge foundation testing devices and other machinery.

Time for Decision on Decontrol Timing

If all goes well, Washington planners hope to decide by February on when to drop curbs on materials' distribution. President Truman may force a decision earlier

WHERE CONTROLLED MATERIALS WILL GO

	TOTAL STEEL (tons)		TOTAL COPPER (thousands of lbs.)		TOTAL ALUMINUM (thousands of lbs.)	
	4th Qtr. 1952[1]	1s Qtr. 1953	4th Qtr. 1952[1]	1st Qtr. 1953	4th Qtr. 1952[1]	1st Qtr. 1953
TOTAL ALL CLAIMANTS	18,272,598	15,253,782	1,453,060	1,424,741	778,385	779,425
CMP REG. 1 DIR. 17 and 18	[2]1,029,673	865,625	[2]40,521	35,560	[2]42,519	38,819
MRO—SELF CERTIFICATION	2,029,971	1,550,000	111,374	109,000	53,030	51,500
DPA-PROGRAM Adjustment Reserve	25,508	.....	4,132	35,340	.....	2,500
GRAND TOTAL	21,357,750	17,669,407	1,609,087	1,604,641	873,934	872,244
SUPPLY	[4]22,030,500	[4]22,157,000	1,382,000	1,369,000	695,000	[5]709,000
PER CENT OF SUPPLY	96.9	79.7	116.4	117.2	125.7	123.0
GENERAL CLAIMANTS	5,776,376	5,549,568	412,580	384,079	319,737	322,862
Agriculture, Department of	37,650	32,940	643	633	45	45
Army, Department of	29,225	25,372	1,418	1,296	70	70
Atomic Energy Commission	218,374	247,817	5,307	6,856	4,932	5,153
Civil Aeronautics Admin.	8,268	12,320	703	540	416	416
Defense, Department of	2,233,000	2,271,000	295,793	268,160	258,000	258,000
Defense Electric Power Admin.	238,116	221,218	60,597	60,532	47,000	50,000
Defense Fisheries Admin.	409	357	25	25	4	4
Defense Mat'ls Proc. Agency	40,900	60,581	1,988	1,988	350	350
Defense Solid Fuels Admin.:						
Coal Mine Construction	10,164	9,140	460	410	25	25
Coke Oven Construction	21,266	18,340	354	354	5	2
Defense Transport Admin.	72,240	63,192	2,860	2,368	150	150
Federal Civil Defense Admin.	2,500	4,400	82	28	20	10
Federal Security Agency:						
Education	124,860	109,234	5,800	5,800	234	200
Hospitals	60,585	52,965	3,875	3,768	390	390
General Services Admin.	20,441	17,852	5,295	3,777	100	98
Housing & Home Finance Agcy.	76,000	62,870	3,345	3,280	10	.....
Interior, Department of	4,579	5,081	142	80	20	9
Maritime Administration	103,253	95,715	1,821	1,712	82	82
OIT-MSA	616,749	494,962	11,430	12,136	6,000	6,000
Petroleum Admin. for Defense	1,551,250	1,434,850	8,752	8,752	1,700	1,700
Public Roads, Bureau of	299,502	303,197	980	980	130	130
Veterans Administration	7,045	6,165	910	604	54	28
NAT'L. PRODUCTION AUTHORITY	12,496,222	9,704,214	1,040,480	1,040,662	458,648	456,563
Agricultural Mach. & Impl.	446,333	336,423	9,333	9,339	13,779	13,806
Aircraft	6,211	6,116	1,452	1,094	10,622	9,692
Aluminum & Magnesium	.....	.....	.....	.....	700	650
Building Materials	715,489	542,942	74,970	74,972	86,826	87,261
Canadian	451,875	357,500	2,995	2,995	2,400	2,770
Chemical	213	159	1,777	1,654	832	372
Communications Equipment	33,473	31,161	58,385	57,832	4,681	3,701
Construction Machinery	466,047	353,276	7,478	7,371	2,147	2,780
Consumer Durable Goods	623,479	468,134	56,043	58,688	83,854	87,556
Containers & Packaging	1,246,262	938,184	384	432	8,338	9,038
Copper	32,150	24,630	3,830	3,615	1,975	1,975
Electrical Equipment	475,170	366,584	161,932	163,328	34,460	34,850
Electronics	50,635	38,963	32,479	29,837	13,732	13,281
Engine & Turbine	475,588	404,586	29,107	29,066	3,084	3,091
Facilities Bureau	558,022	464,842	21,785	21,750	11,700	7,810
Construction Controls	.....	.....	.....	.....	.....	.....
Industrial Expansion	.....	.....	.....	.....	.....	.....
General Components	963,077	731,040	184,303	183,274	22,545	22,601
General Industrial Equip.	437,358	327,285	51,606	51,239	24,402	23,868
Iron & Steel	148,073	103,139	5,296	5,296	110	110
Leather & Leather Products	5,823	5,800	1,333	1,449	988	1,028
Lumber & Wood Products	4,810	3,609	156	156	1,162	865
Metalworking Equipment	443,447	346,595	29,413	27,659	9,064	9,345
Mining Machinery	115,921	91,917	3,480	3,519	195	198
Misc. Metals & Minerals	2,833	2,134	2,956	2,700	102	50
Motion Picture-Photo. Prod.	5,181	4,315	1,463	1,276	3,214	3,101
Motor Vehicle	2,716,859	2,059,745	126,738	127,596	77,637	77,637
Ordnance & Shipbuilding	106,931	93,933	14,243	14,320	1,710	1,845
Printing & Publishing	4,301	3,231	1,175	1,175	674	414
Pulp, Paper & Paperboard	680	.....	56	.....	149	.....
Railroad Equipment	1,421,709	1,071,453	86,300	86,300	5,135	5,135
Rubber	22,763	17,091	3,610	3,503	880	825
Scientific & Tech. Equip.	50,136	38,142	43,444	43,205	14,811	14,068
Service Equipment	191,111	143,194	8,712	8,354	11,130	11,190
Water Resources	165,108	172,591	2,686	2,668	150	150
NPA Reserve (General)	98,188	100,500	7,570	4,000	2,460	3,000
NPA Hardship Cases	10,966	55,000	3,990	11,000	3,000	2,500

[1] As of 8-22-52.
[2] Field Case & Small User Accounts.
[3] Steel—based upon AISI report of actual ingot production.
[4] Steel—estimate of supply as revised through August 20, 1952.
[5] Includes 13,000,000 lbs. of aluminum to cover allotment authority for powder and foil to be returned.

WASHINGTON planners hope to make their final decision next February about the timing of materials decontrol—and particularly the ending of CMP.

By then the new President, whoever he is, will have had time to make known his views, and we shall have come far enough from the steel strike to know more precisely where we stand regarding steel's availability. Copper and aluminum aren't causing too much concern.

Possibility — The government agencies may be forced to decide something as early as December because of budget considerations. President Truman is now working on fiscal 1954's budget and may insist that he know before yearend how much to allow for financing the controls program. If that happens, the planners claim that it will be too early to give more than a by-guess-and-by-gosh judgment.

Fourth and first quarter allocations, as seen in the accompanying table, appear to indicate that the nation's metal users are still in a bad way. But appearances are deceiving (STEEL, Sept. 22, p. 81), and NPA is merely trying to catch up with its paperwork and get tickets in proper balance with supply. The steel strike threw the timing of allocations tickets out of joint; the first quarter of 1953 is the first chance to get the bookkeeping up to date. Fewer first-quarter tickets will be issued, but come fourth-quarter paper still will be good for the first period.

Misinterpreted — The situation has been widely misunderstood in the nation's press. Actually, more steel will probably be produced in the first quarter than in any other three-month period in history because a record annual steelmaking capacity of 115.6 million tons will be ready to produce as of next Jan. 1.

If the Washington planners had to decide today on the timing of decontrols, they would be likely to put the date around next midyear. Steel producers and consumers hope for a wait because they think

that a decision made next February will put the date on most materials decontrol at early in the second quarter.

DPA Sets Gas Pipeline Goals

Defense Production Administration has set expansion goals on large and small pipe laid by gas utilities in 1953. The expansion goal for large pipe—averaging 20 inches in outside diameter—is established at 7200 miles—approximately 1,494,000 tons. The goal for small pipe—averaging 6⅝ inches—totals 17,700 miles, or about 699,000 tons of pipe.

The gas industry estimates that it increased its entire pipeline systems 19,100 miles to 406,600 miles in 1951. This 19,100 total compares with the 24,900 miles of pipe expansion goal set for 1953.

The two expansion goals are based on gas consumption estimates submitted by the Petroleum Administration for Defense. Total sales of all types of gas by utilities are expected to reach 56.6 billion therms in 1952. Annual consumption is expected to climb 23 per cent to 69.8 billion by 1956.

PAD Makes Steel Allotments

PAD announced individual allotments of 66,907 tons of conversion casing and tubing to 153 oil and gas operators for the third quarter of 1952. Allotments for the fourth quarter are 33,268 tons to 224 operators.

All authorizations issued by PAD for fourth quarter purchases of oil-country tubular goods carry a third-quarter symbol. NPA directed recently that all third-quarter tickets for tubular goods would be valid for the rest of the year.

PAD's objective is to make it possible for oil companies operating abroad to get a higher proportion of their oil-country tubular goods from foreign mills. This would reduce the drain on domestic supplies and permit U. S. operators to supplement domestic purchases with foreign casing and tubing.

Estimated 1951 output of oil-country tubular goods from European and United Kingdom mills is 170,000 tons. PAD estimates 1952 production from these mills to reach 250,000 tons.

INDUSTRIAL REAL ESTATE:

Industry Heads For The Wide Open Spaces

RANCH-STYLE PLANTS with plenty of range for future expansion—that's the trend in industrial real estate as older multiple-story plant buildings go begging.

Industrial land in many areas has almost doubled in price in the last two years and the trend continues upward. Reason: The crowded industrialist must either buy land and build his own plant or move into one of the older buildings which are becoming a drug on the market. Chances are good he'll buy if the need for expansion is urgent, and the plot will be big enough to allow for more expansion and plenty of parking.

American Trend — Hardest to rustle up now are the one-story units up to 25,000 square feet, and a distinctly American idea is developing. European manufacturers traditionally retain the same location and remodel existing facilities, but American industrialists increasingly regard the plant as a piece of production equipment which can grow obsolete just as a machine and is best replaced.

That's a big reason why small and medium-sized civilian-goods producers constitute the bulk of plants on the move in many areas, and industrial realtors are busy despite the fact that defense expansion is starting to slow. Realtors report fewer plants than normally are for sale these days, but demand is solid, heaviest in suburban and outlying districts.

Today labor follows the plant. Workers don't mind driving twenty or thirty miles to work if they have good highways and parking facilities when they get there. Or they don't mind living in specially constructed communities as near Las Vegas, Nev., where an airplane plant is being constructed out in the middle of the desert with 1500 workers' homes, all air conditioned.

Stable Rentals—Rentals on existing buildings have not increased as greatly as land values. General prices have moved to about 70-80 cents per square foot against 50-60 cents two years ago. Some investors are finding it profitable to build industrial buildings on their own land for lease to companies which are looking for elbow room in the smaller plant size. Rent for such units now commands about $1.25 per square foot and is regarded as well worth the tariff by firms finding it wiser to rent.

Though a few industrial buildings are selling high, industry tends to be more realistic about its housing expenditures than many individuals are. Purchases today are dictated by economics rather than emergency. Properties which are fairly priced on the basis of depreciated value rather than reproduction cost are in good demand and the sales prices for such properties are stabilized with no increase likely.

Fertile Field—In a new venture, many insurance companies and other fiduciary institutions have invested in industrial real estate since the war. Now they hold a vast amount of this property in their portfolios and they're using their investment policies and sales to promote stable values.

Public utilities are also finding it worth while to enter the real estate field. Cleveland Electric Illuminating Co. bought parcels of land which they hope to sell to industrial concerns outside of the Cleveland area for expansion. Other utilities firms offer complete plant location service including finding suitable plant sites, checking freight rates and even putting pressure on a municipality to provide sewage and water facilities.

It all adds up to a steady real estate market for buyers over the next year or two, in the opinion of most industrial realtors. When industry's on the move, so is industrial real estate.

When a high-strength steel is needed

for severe cold-formed shapes like these bumpers

Specify → **N-A-X** HIGH-TENSILE STEEL

and get all of the requirements of SAE 950

When a material meeting the requirements of the high-strength, corrosion-resisting steels of SAE Specification 950 is used for severe cold-formed shapes, it will pay to investigate N-A-X HIGH-TENSILE steel—the low alloy steel with *built-in formability*. Its finer grain and higher hardness also result in brighter luster when ground and polished for plated parts.

GREAT LAKES STEEL CORPORATION
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Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

By H. C. TUTTLE, Detroit Editor

Mirrors of Motordom

Auto men expect to have enough steel, copper and aluminum to turn out 1,250,000 cars and 315,000 trucks in the first quarter, despite reports to the contrary

DETROIT

IT WAS A CASE of sound and fury signifying nothing—that announcement by the government that first quarter steel allocations to civilian industries would be 25 per cent lower than fourth quarter.

Actually, the auto industry has been authorized to produce and probably can get the steel, copper and aluminum for 1,250,000 cars and 315,000 trucks in the first quarter. The ceiling on cars is 100,000 units higher than in the fourth quarter, and the total vehicle quota is the greatest since production curbs were imposed.

Explanation—The reason for the sound and fury is misinterpretation by newspapermen of the NPA release, which carried more than an ordinary amount of Washington baffle-gab. The confusion arises in the conclusion that issuance of new tickets for controlled steel is the same thing as receipts of steel. It's not. For an explanation of the technical aspects of alloting for the first quarter, see p. 58 and last week's STEEL, p. 81.

What it all adds up to for the auto industry is this: Auto builders have been rationed enough copper and aluminum to reach their production ceilings, and they think they'll get enough steel from the carryover fourth quarter steel tickets, the new first quarter tickets and conversion and foreign metal. The tightest steel products, with the exception of forging bars, are not used in any quantity by the auto industry. If he is willing to pay the price, any auto builder can get some of his steel from converters. One prominent converter is even doubtful that his now-filled order book for fourth quarter will remain firm.

Competitive Selling in 1953

Automotive sales chiefs are thoroughly convinced that next year is going to hold an almost forgotten experience—competitive selling. The market, said one, has been competitive for a month or so in some of the past years, but 1953 will be the first postwar year when manufacturers and dealers will have to hustle all the time.

Larry Doyle, sales and advertising manager of Ford Motor Co., told a bunch of South Carolina dealers that "long after all the other regulations are gone, regulation 'c'—'c' for customer—will be with us. Let us never forget that the biggest and sharpest control over our operations doesn't come from Washington but from Main street in our own home towns." Talking about the problems of selling after controls have been lifted, he advised that "the decontrol of many materials will occur earlier than is now predicted."

Paul R. Davis, Studebaker sales manager, told North Dakota dealers the industry is about ready for "the big push" after having had to go along at a snail's pace. Selling cars, he warned, "won't be as easy as it has been in recent years." But, he advised, a good new car market is assured in 1953. Pricewise, he said, the American car "is still the best buy on the market—the most product for the money in the entire world." Relating the Studebaker Champion's price to North Dakota farm produce, he said 731 bushels of wheat today buy a better car today than 890 did in 1941, and the factory worker has to put in 10 per cent fewer weeks to buy today's car than he did 12 years ago.

In Arkansas, Joe Bayne, general sales manager of Lincoln-Mercury, was saying substantially the same thing—that a free-for-all competitive struggle would be back as soon as governmental production limitations were lifted. The manufacturers, he said, are preparing themselves, through design of new models, increased sales training and promotion activities, and expanded production facilities. He, in effect, advised the dealers to "go thou and do likewise."

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	322,581*	571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
Aug. 23	109,588	138,797
Aug. 30	122,632	137,479
Sept. 6	111,095	103,224
Sept. 13	137,295	136,150
Sept. 20	142,494	135,015
Sept. 27	145,000*	113,973

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

UAW, GM Talk Contract

"Don't let them take it away" carries the meaning of what the UAW-CIO is after in suggesting to General Motors Corp. that it "implement" its contract.

The GM council, which consists of two members of each GM local, presented the automaker with a resolution asking for three things: Increase in the annual "improvement factor" from four cents to five cents an hour in June, 1953, and June, 1954; increase the present $125 a month pension by an amount which would make up for the loss in purchasing power since the contract took effect May 29, 1950; put a floor under the escalator clause so that not more than five cents an hour could be lost through a decline in the Bureau of Labor Statistics' cost-of-living index. This last would be done by incorporating into the base rate the difference between the five cent "float" and the cost of living allowance paid at any future time.

This resolution cannot rightly be

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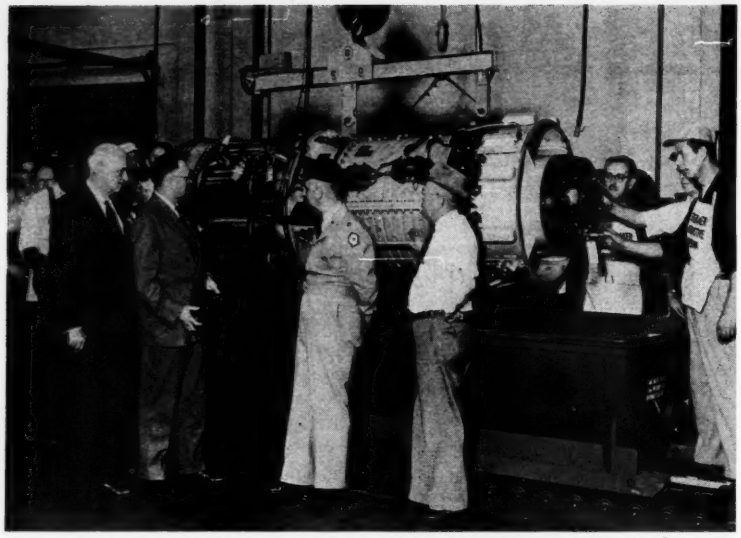

Ceremonies Hail First Studebaker Turbojet Engine

Officials at Studebaker Corp. watch as the first 2650-pound turbojet engine made by the South Bend, Ind., company is lowered into a metal container to be shipped to the Air Force. Present are (left to right) Harold S. Vance, board chairman and president, P. O. Peterson, executive vice president, Lt. Col. John Keller, Air Force representative, and George Westphal, plant superintendent

called a "demand." It is a suggestion, given without any heat or rancor, to the corporation, and explaining in logical terms why these three changes would be fair. It makes use of a quote by GM's C. E. Wilson as an argument for the increase in the improvement factor. The reason for this particular proposed change is that the improvement factor is derived from an average 2½ per cent annual increase in productivity which, applied to the average wage rate when the contract was made, amounted to four cents. With the addition of 35 cents an hour since May, 1950, to the average wage, that percentage now is the equivalent of 4.9 cents. Its argument for the incorporation into the base rate of all but five cents of the cost-of-living allowance is also well thought out. It cites many later contracts in heavy goods industries which have added cost-of-living adjustments to the base rates.

The significance of this resolution is considerable—not because of any implied threat—but because it was made to General Motors first. The same changes will also be asked of all other companies. With GM, some informed sources believe, the UAW stands a chance of working out some sort of compromise. That GM did not flatly refuse to consider the request lends credence to this belief. It is known that GM and union officials have been quietly discussing some of the proposed changes since before the steel strike.

If some adjustment in the contract should be made in the next several months, any implication that GM is "soft" would be erroneous, in the opinion of one labor trend analyst. GM, if it makes any concession on any of these points, would do so only in return for some strengthening of its own hand in matters of production standards or procedures for disciplinary action.

GM, it is thought, might possibly agree to a floor beneath the escalator, but at the same time would resist most firmly what seems to be a corrollary—that part of the cost-of-living allowance be put into the base rate. Too many fringe matters are figured on the base rate to make it wise for GM to concede on this point, it is felt. There is another possibility, although remote because of the UAW's probable unwillingness, and that is that GM may try to get an extension of its contract beyond 1955 in return for some of the proposed modifications.

Chrysler Elevates Three

Three new vice presidents have been elected by Chrysler Corp. in recognition of the importance of their posts. They are: Carl J. Synder, a veteran of 30 years with Chrysler and its predecessor, Maxwell Co., who is operating manager of Chrysler Corp. and is in charge of the company's over-all operations; Robert W. Conder, who became director of labor relations in 1939 and director of industrial relations in 1951; and James Cope, who joined the organization as assistant to the president eight years ago and is executive in charge of corporation public relations.

Tooling-Up Nearly Complete

The tool-up phase of many defense plants of the auto industry is now reaching an end. Among the latest companies to progress from make-ready to production are Studebaker and Buick with their jet engine assignments. First Wright J-65 Sapphire engine was delivered by Buick to the Air Force for testing 19 months after the contract was awarded. Buick thereby beats Wright Aeronautical which was supposed to have its Ridgewood, N. J., plant going first.

Mass production of these engines still appears some distance off, the Air Force admitting that this is one jet program which has "fallen behind badly." Buick's biggest new plants for manufacture and assembly of the J-65 are still far from completion. Three plants are involved in Studebaker's production of General Electric's J-47 engine. Machining of small parts is centered at its New Brunswick, N. J., plant, larger parts are being machined at a government-owned plant in Chicago, and the Studebaker aviation plant at South Bend, Ind., is used for final assembly.

Of interest is Studebaker's innovation in jet engine assembly. Patterned to a great extent on automotive assembly line technique, the system is extensively conveyorized and provides for the engine's assembly in the upright position instead of the conventional horizontal assembly.

THE NEW BRITAIN MACHINE COMPANY

NEW PRODUCT DESIGNS DEMAND NEW MACHINING METHODS

This New Britain Automatic developed for contour facing jet compressor wheels

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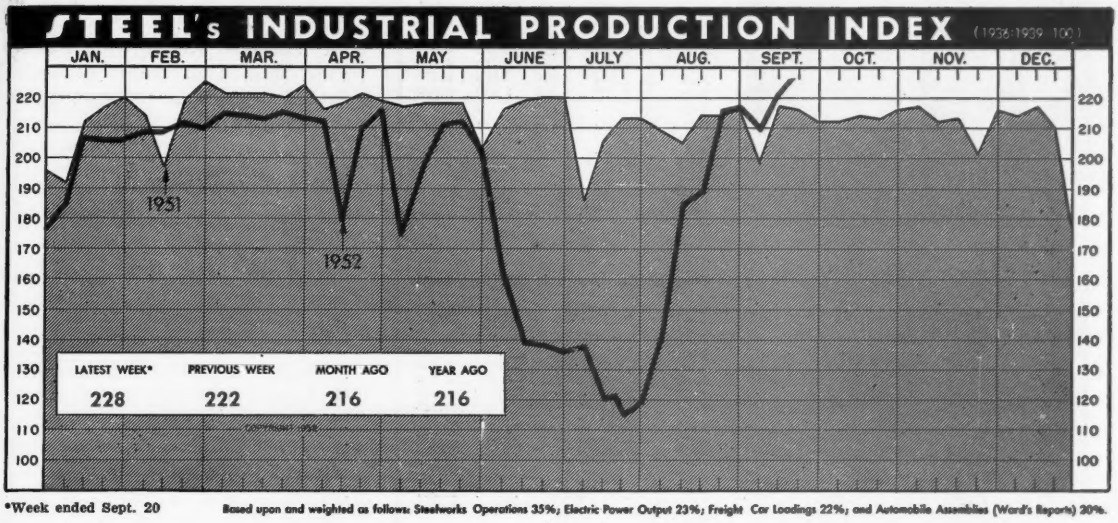


*Week ended Sept. 20 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Makers of heavy civilian durables are preparing for high output, as low consumer debt indicates good selling in 1953. Index spurts as steel and auto-truck output soar

GOOD SALES weather for consumer durables may be one of the outstanding features of 1953.

Makers of stoves, refrigerators, passenger cars and other heavy consumer items are already gearing for high output. These manufacturers—watching the current sales uptrend—are saying that sales will continue to rise this year and level off on a high plateau in 1953. Prime reason for this is that consumer credit is improving rapidly.

Paid Up — Many consumers rushed to dealers and made down-payments on 2-year purchases during the weeks immediately following Korea. They are now paying their final installments on these goods. The government, however, slapped 15-month installment restrictions on most purchases at the end of September, 1950. Persons making down-payments during the boom after that date are already paid up. Spending by these consumers may well be causing most of the present sales uptrend.

Manufacturers also are supplying more incentives. Metalworking companies are adding many new gadgets on their 1953 civilian items. These companies are doing practically everything to avoid a demand lag similar to the consumer apathy which occurred earlier this year.

Add to these factors the rise in consumer prices. The consumer price index of the Bureau of Labor Statistics climbed to a record peak in August. Civilians may be encouraged to buy quickly before prices climb even higher—particularly now that most federal installment restrictions are removed.

Index Jumps—Spurred by the increase in steel and automotive production, STEEL's industrial activity index jumped 6 points to 228 per cent of the 1935-1939 average in the week ended Sept. 20. Auto-truck operations rose 15,199 units and steel turnout rose 1 point to 102 per cent of rated capacity. Electric power output edged up slightly, while carloadings dipped during the week ended Sept. 20.

Steel Turnout Nears Peak . . .

Steel production is edging up to the high levels attained before the strike. U. S. plants turned out 2,125,000 net tons of steel for ingots and castings in the week ended Sept. 27, says the American Iron & Steel Institute. This is 4000 tons above the previous week and 66,000 net tons under the record turnout in the week ended May 31.

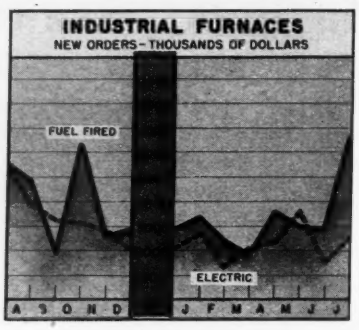
Automakers Set New Record . . .

Automakers are continuing to set output records for the year, as the industry strives to fill dealers' stocks depleted by the steel strike. U. S. plants assembled 105,135 passenger cars in the week ended Sept. 20, the highest turnout in 15 months, says *Ward's Automotive Reports*. But breaking records may become customary in the next few weeks.

U. S. and Canadian plants produced 142,494 auto-truck assemblies in the week ended Sept. 20. This output is 5199 units above the previous week's operations and well over the 135,015 auto and truck assemblies in the same week, 1951.

Housing Level Maintained . . .

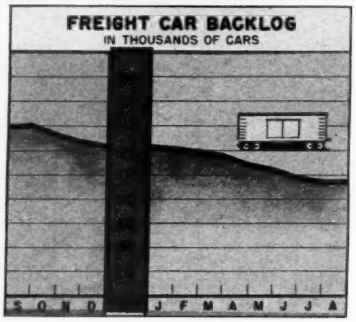
Private housing and highway construction are the main supports in the recent construction boom. Private mass housing overshadowed all other types of construction with awards totaling $90 million, or 55 per cent above the average 1952 week in the week ended



Industrial Furnaces
New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1952	1951	1952	1951
Jan.	3,379	4,033	2,856	2,764
Feb.	2,413	4,670	1,363	3,312
Mar.	1,813	7,019	2,100	4,846
Apr.	3,606	8,497	2,298	3,657
May	3,032	5,044	3,713	4,766
June	2,954	6,259	1,552	3,370
July	6,728	5,303	2,530	5,587
Aug.	....	4,850	....	3,891
Sept.	....	1,821	....	3,250
Oct.	....	6,374	....	3,172
Nov.	....	2,516	....	2,882
Dec.	....	2,875	....	2,100

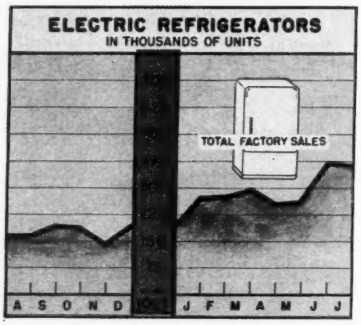
* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1952	1951	1952	1951
Jan.	5,338	26,356	120,251	144,758
Feb.	7,358	15,947	118,900	154,861
Mar.	5,619	11,271	115,854	158,619
Apr.	397	6,628	108,270	155,871
May	2,502	4,919	103,910	150,628
June	3,264	6,793	99,615	147,725
July	1,536	2,417	95,265	144,810
Aug.	4,558	1,828	95,761	139,014
Sept.	....	9,657	.....	140,135
Oct.	....	3,464	.....	132,792
Nov.	....	6,752	.....	129,158
Dec.	....	3,309	.....	123,947
Total	....	96,190		

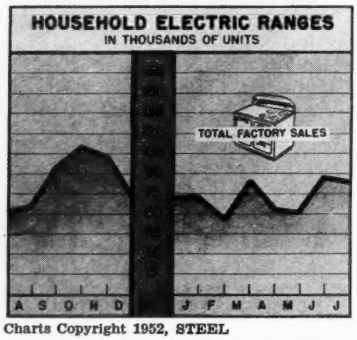
* End of month.
American Railway Car Institute.



Electric Refrigerators
Total Factory Sales—Units

	1952	1951	1950
Jan.	275,297	465,903	375,856
Feb.	277,986	403,035	461,256
Mar.	298,092	558,503	586,293
Apr.	255,009	409,887	546,279
May	256,378	309,722	542,856
June	374,199	261,298	549,740
July	366,372	163,922	507,029
Aug.	.....	165,309	518,359
Sept.	.....	193,929	535,002
Oct.	.....	191,519	420,431
Nov.	.....	147,394	411,201
Dec.	.....	195,403	394,268
Total	.....	3,465,824	5,848,579

National Electrical Mfrs. Assn.



Household Electric Ranges
Total Factory Sales—Units

	1952	1951	1950
Jan.	72,830	130,316	97,925
Feb.	55,728	121,585	118,989
Mar.	83,485	159,865	145,417
Apr.	62,746	118,823	132,859
May	61,209	106,685	145,498
June	88,063	106,589	158,534
July	84,325	60,530	130,505
Aug.	.....	64,042	132,243
Sept.	.....	93,551	156,216
Oct.	.....	109,043	130,452
Nov.	.....	101,476	129,384
Dec.	.....	72,140	124,360
Total	.....	1,244,645	1,602,382

National Electrical Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Sept. 15	Indus. Production..Sept. 15	Ranges, Gas .....July 28
Durable Goods....Sept. 22	Ironers .....Aug. 25	Steel Castings ....Sept. 22
Employ., Metalwkg.Sept. 8	Machine Tools ....Sept. 1	Steel Forgings ...Sept. 15
Employ., Steel ....Apr. 28	Malleable Castings Sept. 22	Steel Shipments....July 23
Fab. Struc. Steel..Sept. 1	Pumps .....Sept. 1	Vacuum Cleaners..Aug. 18
Foundry Equip. ..Sept. 1	Prices, Consumer..Sept. 8	Wages, Metalwkg..Sept. 8
Gear Sales .....Sept. 15	Prices, Wholesale..Sept. 8	Washers .....Aug. 18
Gray Iron Castings Sept. 22	Radio TV .....July 21	Water Heaters ....Aug. 18

Sept. 18, says *Engineering-News Record*. Highway construction rose to $35.2 million, about 17 per cent above the average week.

Industrial building continued to decline that week. Contract awards for industrial construction totaled $18.4 million in the week ended Sept. 18, nearly 64 per cent under the average week to date.

Tool Orders Decline . . .

Machine tool orders are again on the downgrade. New order index of the National Machine Tool Builders Association plunged 62.9 percentage points in August to 311.7 per cent of the 1945-1947 average. Tool shipments increased in August to 316.0 per cent of the 1945-1947 average, as production rose to 351.5 per cent. The industry had 12.3 months' work in back orders on Sept. 1, says the association. This compares with a 19-month backlog on Jan. 1, and 23 months in back orders on Nov. 1, 1951.

Range Shipments Up . . .

Shipments of gas ranges rose more than seasonally in August, in line with the increased demand for heavy appliances. Range shipments rose to 179,000 units in August, over July by some 54,500 units and the highest volume since April. The August shipments rose 6.5 per cent above shipments in August, 1951.

Industry shipments of automatic gas water heaters also soared. Reflecting probably the upsurge in homebuilding this year coupled with the rise in appliance sales, shipments of water heaters hit 168,000 units in August. That's the highest shipment total since April, 1951, when 199,400 water heaters were shipped.

Employment Bounces Back . . .

Non-farm employment rose by nearly 900,000 to 46.9 million workers between mid-July and mid-August, says the Commerce Department. An alltime record for the month was reached as industry swung back rapidly into production after the steel strike.

Manufacturing employment rose by 700,000 to 15.9 million workers

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	102.0	101.0	101.0
Electric Power Distributed (million kwhr)	7,725	7,654	7,013
Bituminous Coal Output (daily av.—1000 tons)	1,972	1,820	1,518
Petroleum Production (daily av.—1000 bbl)	6,300[1]	6,278	6,282
Construction Volume (ENR—millions)	$260.5	$264.6	$232.4
Automobile, Truck Output (Ward's—units)	142,494	137,295	135,015
TRADE			
Freight Car Loadings (unit—1000 cars)	870[1]	881	864
Business Failures (Dun & Bradstreet, number)	145	91	160
Currency in Circulation (millions)[3]	$29,292	$29,364	$28,140
Dept. Store Sales (changes from year ago)[3]	−1%	−1%	0%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,150	$14,962	$18,734
Federal Gross Debt (billions)	$263.0	$262.8	$256.8
Bond Volume, NYSE (millions)	$13.9	$14.4	$14.2
Stocks Sales, NYSE (thousands of shares)	5,426	6,099	10,180
Loans and Investments (billions)[4]	$75.3	$75.2	$70.7
United States Gov't. Obligations Held (billions)[4]	$31.8	$31.9	$30.7
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.40	181.40	171.92
STEEL's Nonferrous Metal Price Index[6]	223.2	223.2	224.6
All Commodities[7]	111.3	111.4	115.0
All Commodities Other Than Farm and Foods[7]	112.7	112.6	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

in mid-August, reflecting recovery in basic steel and metalworking plants and the seasonal upsurge in food and soft goods industries. Employment in mining and transportation rose 140,000 in August as striking ore miners and idled coal and railroad workers returned to their jobs.

By the end of August, workers claiming state unemployment benefits declined to a postwar low for the season, as many plants expanded employment above pre-strike job levels.

Dividend Payments Rise . . .

Corporations paid $231 million in cash dividends during August, 7 per cent more than the $215 million they disbursed in August, 1951, says the Commerce Department. The dividend rise in August—which is usually a light payment month—resulted almost entirely from changes in payment dates of corporations.

During the first eight months of 1952, publicly reported cash dividends rose 5 per cent above the same period in 1951. Manufacturers' dividends rose 4 per cent above the same months a year earlier. Dividends in the oil refining industry rose 21 per cent, while producers in the nonferrous metals, machinery and electrical machinery categories averaged 10 per cent more in cash dividends. Total dividends by basic iron and steel producers were $248.2 million in the first eight months of 1952. That's a slight increase over the $245.7 million these companies paid out in dividends during the first eight months of 1951.

Coal Output Jumps . . .

As the strike deadline neared, output of bituminous coal rose to peak levels. Soft coal production reached a daily average of 1,972,000 net tons in the week ended Sept. 13, estimates the National Coal Association. That's an increase of 153,000 net tons over daily output in the previous week, and the highest daily average this year to date.

Trends Fore and Aft . . .

Department store sales fell 1 per cent under the poor year-ago volume in the week ended Sept. 13 . . . Net public and private debt rose $33 billion in 1951. Private debt rose to $31 billion, higher than any peacetime year . . . Freight car loadings in the week ended Sept. 13 rose 3.6 per cent above the same week in 1951 . . . Shipments of nonferrous castings dropped 17 per cent in July.

which cold-rolled strip steel costs less "in the end"

- if variations in physical characteristics are permissible
- if fairly heavy oversize gauge variations are not objectionable
- if the fabricating operations are not too complicated and do not require intricate, expensive dies
- if a fine surface finish is not essential
- if a good base for paint or enamel is desired
- if you do not object to some "square footage" loss due to oversize variation
- *then Sheet Coil will probably be the most economical material for the job* • • •

• • • on the other hand—

- if you must have a high degree of uniformity of chemistry and physical properties—and precision gauge tolerances
- if you wish to avoid rapid die wear due to heavy oversize gauge variations
- if you require a fine finish or a better base for plating
- if you want maximum "square footage" for greatest parts yield per ton
- if you want selected tempers for maximum strength and lightest weight
- *then you'll find C. M. P. THINSTEEL far and away the most economical material.*

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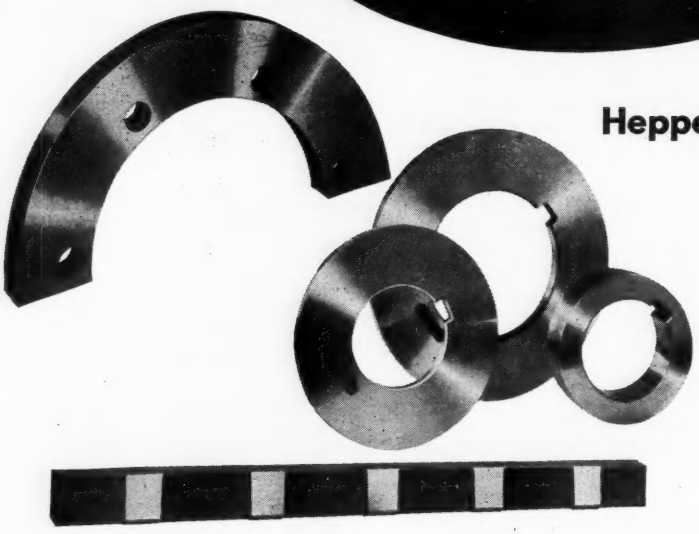
THE SABRE . . . a blade that cleared the way to victory.

Through past military history, the Cavalry was used to break holes in the ranks of the enemy and clear the way for the main assault. The famous Cavalry sabre was used both as a cutting and thrusting weapon by the attacking Cavalrymen. It could withstand the severe blows of steel against steel in battle action.

famous blades



Heppenstall SHEAR KNIVES . . . clear the way for better production.

The way is cleared for better production when modern Shear Knives made by Heppenstall are part of your manufacturing line. Records of performance taken from plants where these knives are in daily use show:

- MORE CUTS BETWEEN GRINDS
- MORE UNITS PER BLADE
- LOWER OVERALL BLADE COST
- INCREASE IN PRODUCTION

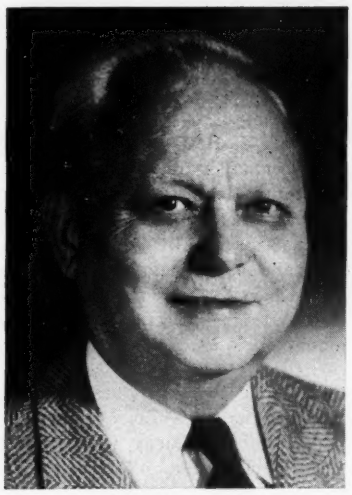
To be certain of consistent high quality and productivity—always specify Heppenstall.

Heppenstall—*the most dependable name in forgings*

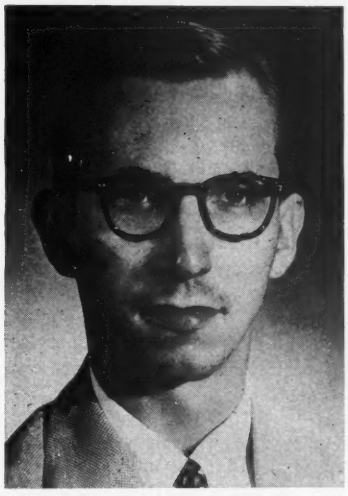
PITTSBURGH 1, PENNSYLVANIA

Sales offices in principal cities

Men of Industry



RAYMOND G. RECH
. . . positions at Arens Controls



REXFORD C. BURNHAM
. . . Fauver hydraulic div. mgr.

HAROLD A. BURNIP
. . . purchase engineering at Lincoln

Arens Controls Inc., Evanston, Ill., elected **Raymond G. Rech** as director, vice president in charge of production and treasurer. He joined Arens in June, 1951.

At **Chain Belt Co.**, Milwaukee, **Luther H. Bosnian** was named vice president in charge of manufacturing facilities, **F. D. Tincknell**, assistant treasurer, and **Lyman Newton**, controller to succeed the late **A. F. Kessler.**

John Davies was promoted to assistant chief engineer, Cleveland axle division, **Eaton Mfg. Co.** He replaces the late **Harry H. Hooker.** In addition **Chester D. Christie**, who will assume many duties previously handled by Mr. Davies, was appointed staff engineer.

Pacific Airmotive Corp., Burbank, Calif., named **L. B. Littrell** general manager, aircraft operations; **Harlan K. Perrill** as manager, engine division, Burbank plant.

Ernest W. Rothaar was appointed to the newly created post of supervisor of the master mechanic's division at **Briggs Mfg. Co.**, Detroit. In this position he is responsible for co-ordinated functioning of contracts between various Briggs divisions and the company's customers.

Rexford C. Burnham was appointed hydraulic division manager, **J. N. Fauver Co. Inc.**, Detroit. His previous experience includes four and a half years with Wright Aeronautical Corp. and subsequently six years in the press division of French Oil Mill Machinery Co.

U. S. Steel Co. appointed **Herbert J. Watt** and **F. Royal Gammon** as assistant vice presidents in charge of sales in, respectively, the western and eastern areas. Mr. Watt is located in Chicago, Mr. Gammon in New York.

Henry Sandrock was named plant manager of the pressed metal division of **Chevrolet Motor Division**, General Motors Corp., Detroit, to succeed the late **J. H. Glass.** Mr. Sandrock has been general superintendent of production.

J. D. Bryan Jr. was made sales promotion manager, **Peden Iron & Steel Co.**, Houston.

E. W. Herbert, comptroller, **Great Lakes Steel Corp.**, Ecorse, Mich., was elected assistant vice president.

J. J. Matich was appointed industrial sales engineer, **Parker Appliance Co.**, Cleveland, with headquarters in Indianapolis.

Harold A. Burnip was appointed director of purchase engineering for **Lincoln Electric Co.**, Cleveland. He has been with Lincoln ten years, recently as project engineer, before that as purchasing agent.

Pittsburgh Steel Co. appointed **Charles D. Steele** as superintendent of blast furnaces for its Monessen, Pa., plant.

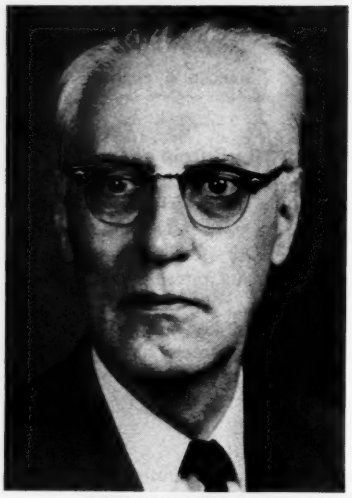
Kennametal Inc., Latrobe, Pa., appointed **Fred Hennig Jr.** manager of the Chicago-midwestern district succeeding **R. B. Weeks**, retired.

Fred L. Etchen was appointed Detroit district sales manager, **Pittsburgh Steel Products Co.**, effective Oct. 1. He succeeds **John M. Leahy** who continues as an agent for the company in the sales of materials handling equipment.

Hans C. Anderson was appointed methods improvement engineer at the Pittsburg, Calif., plant of **Columbia-Geneva Steel Division**, U. S. Steel Co. **Victor V. Nordlund** was made plant industrial engineer at the company's Gary, Ind., Sheet & Tin Mills succeeding Mr. Anderson.

Frank R. Benson succeeds **David R. Hutton** as superintendent of maintenance at **United States Steel**

ARTHUR LEHR
. . . Bliss & Laughlin V. P.



HENRY J. FISCHBECK
. . . P&W staff metallurgist

WALTER V. FARR
. . . treasurer of AS&W

Co.'s Johnstown, Pa., plant. Mr. Hutton retires after 46 years with the firm.

Bliss & Laughlin Inc., Harvey, Ill., elected **Arthur Lehr** as vice president. His previous experience includes ten years in the sales department of Bethlehem Steel Co. Prior to association with Bliss & Laughlin Mr. Lehr was executive vice president and general manager of St. Paul Foundry & Mfg. Co.

Earl F. Riopelle was appointed to the newly created position of manager of engineering, **Houdaille-Hershey Corp.**, Detroit. He joined the company in 1951 as supervisor of engineering for the western divisions.

Henry J. Fischbeck was appointed staff metallurgist in **Pratt & Whitney Aircraft Division's** advanced tool engineering group. He is succeeded by **Spencer W. Deming** as supervisor of metallurgical and chemical processing in the production engineering department of P&W, division of United Aircraft Corp., East Hartford, Conn.

George E. Kerr, formerly with Yale & Towne Mfg. Co., is now sales engineer with **Lobdell United Co.**, Wilmington, Del., subsidiary of United Engineering & Foundry Co.

George A. Schiller was named assistant sales manager, **Dollinger Corp.**, Rochester, N. Y. He has been with Dustex Corp.

Walter V. Farr was made treasurer, **American Steel & Wire Division**, U. S. Steel Co. He was assistant treasurer of the wire division in the Chicago district and moves to Cleveland to succeed **John J. Farrell**, promoted to assistant treasurer of U. S. Steel Co. in Pittsburgh.

Donald M. Jenkins was appointed chief engineer of **General Motors Ltd.**, London, Ont., succeeding **D. J. Smilanich**, transferred to another post.

J. H. Lindemuth, works manager at the Mead, Wash., plant of **Kaiser Aluminum & Chemical Co.**, was named works manager at the company's Chalmette, La., plant. He succeeds **C. P. Love**, now plant manager at Tacoma, Wash. **Walter Bast** becomes plant manager at Mead, promoted from assistant manager.

Baker-Raulang Co., Cleveland, added **Walter S. Maranuk** to its Detroit staff.

Matthew J. Betley was appointed works manager for **Aeroquip Corp.**, Jackson, Mich. He formerly was works manager for Electric Sprayit Corp. **George J. Fischer** becomes general sales manager of Aeroquip following 18 years with B. F. Goodrich Co., most recently serving as manager, V-belt and packing sales.

Charles T. Evans Jr. resigned his position as director of development and metallurgy with **Elliott Co.**, Jeannette, Pa., effective Oct. 1.

A. P. Fontaine resigned as executive vice president, **Consolidated Vultee Aircraft Corp.**, San Diego, Calif.

J. H. Shockcor was appointed a sales engineer for **Enthone Inc.**, New Haven, Conn.

Kenneth R. Blaisdell was appointed as field engineer in the Springfield, Mass., territory by **Bellows Co.**, Akron.

Franklin B. Stockton was appointed assistant to the chief industrial engineer at **Jones & Laughlin Steel Corp.**, Pittsburgh. He has been in the personnel relations department since 1950.

Tjark F. Riddle was appointed aircraft plant manager at Willow Run, Mich., for **Kaiser-Frazer Corp.**

At **Boston Woven Hose & Rubber Co.**, Boston, **H. S. Johnson** becomes director of merchandising, **L. M. Atwood** assistant general sales manager and **J. H. Alsen** director of engineering applications.

E. M. Webb was elected to the board of **Duff-Norton Mfg. Co.**, Pittsburgh. He is vice president and general manager of the company.

H. E. Townsend, sales director, **Hiram Swank's Sons**, Johnstown,

No Pressure Wipe-Off on Gears Lubricated with Sun 897 Grease

Even heavy tooth loading won't cause Sun 897 Adhesive Pressure Grease to squeeze out. It stays on the gears, prevents metal to metal contact, prolongs gear life, and reduces lubrication costs. Sun 897 is most valuable where *throw-off* with resultant wear and spotting of products must be avoided. It is easily applied with a brush on open gears, sprockets, chains, slides, cams, cables, couplings and linkages. For complete information, consult your nearest Sun representative or write Department S-9.

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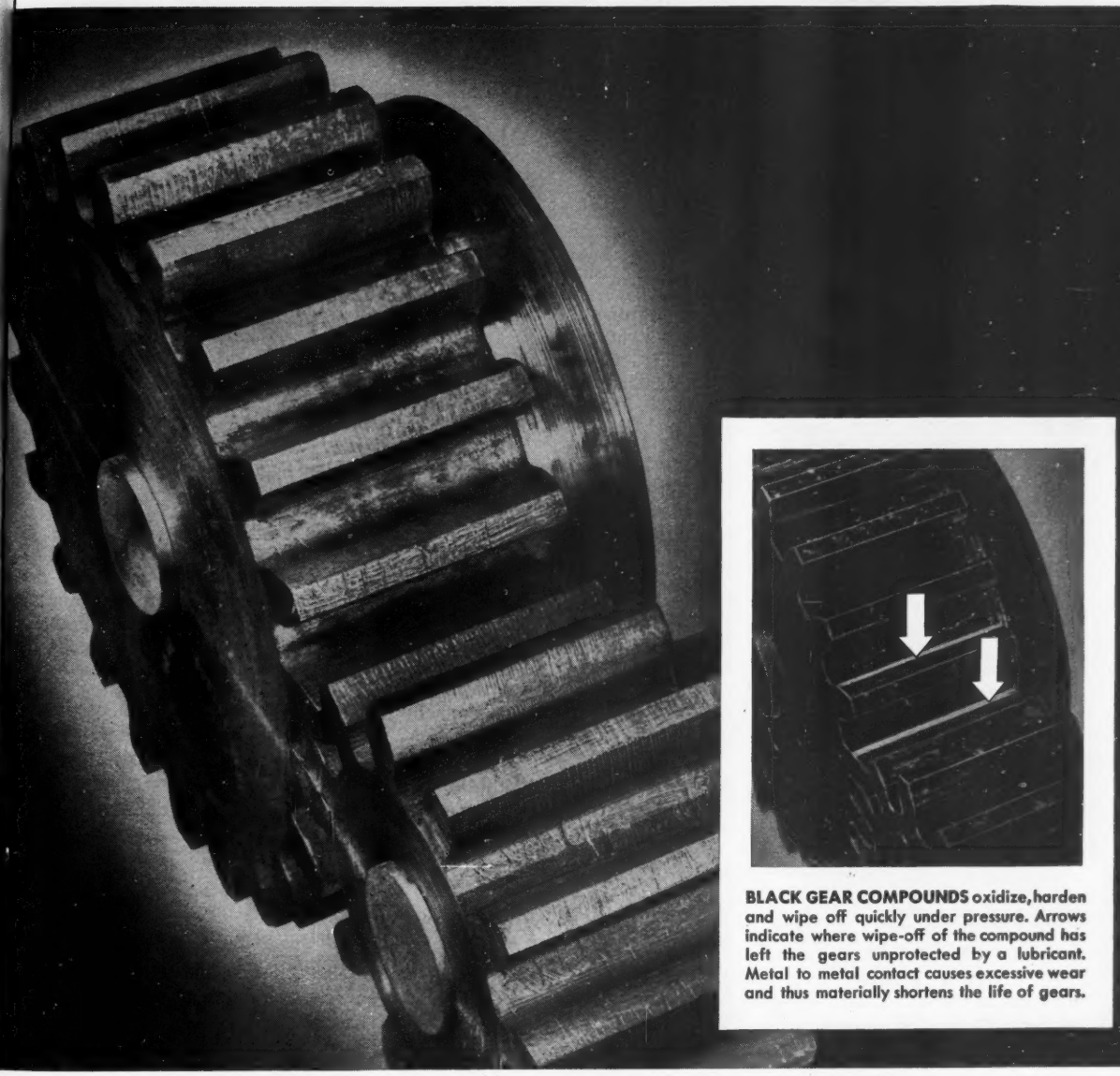
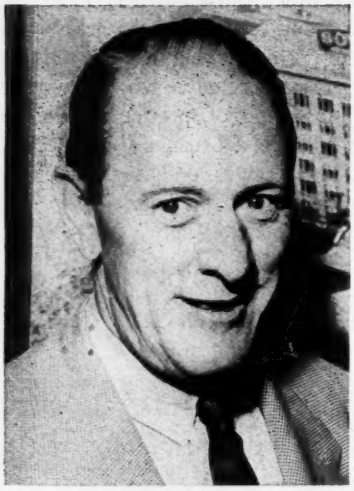
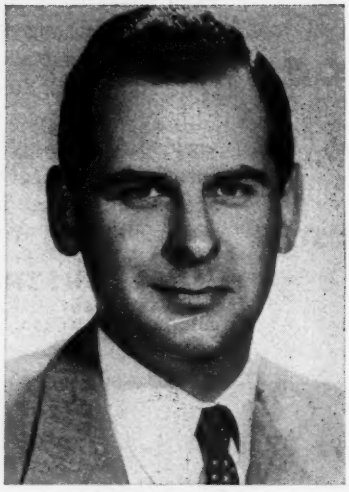


BLACK GEAR COMPOUNDS oxidize, harden and wipe off quickly under pressure. Arrows indicate where wipe-off of the compound has left the gears unprotected by a lubricant. Metal to metal contact causes excessive wear and thus materially shortens the life of gears.

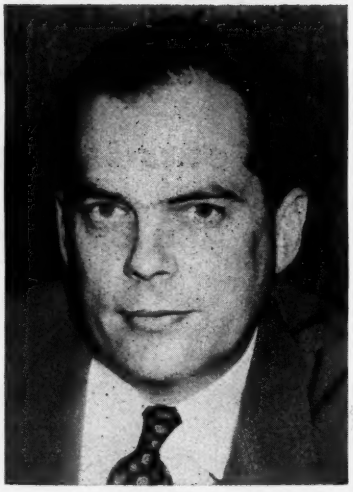
NO SQUEEZE-OUT due to pressure. A thin, transparent film of Sun 897 Adhesive Pressure Grease stays evenly distributed on the gears and gives positive lubrication at all times. Sun 897 is water resistant and can be easily applied with a brush.



ROBERT L. HOLT
. . . Bowser Inc. V. P.



GEORGE B. MOSELEY
. . . Firestone Steel Products sales mgr.



C. R. BOLL JR.
. . . gen. sales mgr., Cummins Engine

Pa., retired after 23 years in that position.

Robert L. Holt was elected vice president of **Bowser Inc.**, Ft. Wayne, Ind. For the last few years he has served on the board of directors and on the finance committee of Bowser.

Promotions at **Republic Steel Corp's** Warren, O., plant, headed by appointment of **Harry T. Brunstetter** as superintendent of the silicon strip department, include **William E. Schnitgen** as assistant superintendent succeeding Mr. Brunstetter and **P. R. Cleary** as lubrication engineer for the Warren district.

James H. Sutherland was appointed manager, Pittsburgh district office, **SKF Industries Inc.**

Townsend Co., New Brighton, Pa., appointed **Robert W. Daumiller** as assistant purchasing agent.

George B. Moseley was made general sales manager of **Firestone Steel Products Co.**, Akron. He has been sales manager for contract manufacturing.

Wilbur Gardner, secretary-treasurer of **DeWalt Inc.**, Lancaster, Pa., subsidiary of American Machine & Foundry Co., was elected a vice president.

Sintercast Corp. of America, Yonkers, N. Y., appointed **J. W. Mull Jr.** of Indianapolis as sales representative for Indiana, western Ohio and northern Kentucky.

Alex Montgomery Jr. was appointed assistant to vice president-rolling mills, **United States Steel Co.**, Pittsburgh. He has been assistant general superintendent of the company's Duquesne Works and is succeeded by **Oscar Pearson**, formerly at the Gary Works in the position of division superintendent of steel production.

C. R. Boll Jr., formerly manager of engine sales, was appointed general sales manager, **Cummins Engine Co. Inc.**, Columbus, Ind.

Fred W. Scott Jr. is manager of the newly established merchandising sales division of **Carborundum Co.**, Niagara Falls, N. Y. He formerly was manager of sales for the coated products division.

E. W. Gutgsell was promoted to sales manager, southwest division, **Cory Corp.**, Chicago.

Buffalo Steel Division, **H. K. Porter Inc.**, Tonawanda, N. Y., appointed **W. S. Truesdell** to the newly created position of assistant general manager. He has been general sales manager and continues supervision of sales.

S. Frederick Magis was named steel technologist at Armour Research Foundation of Illinois Institute of Technology, Chicago.

OBITUARIES...

Leonard T. Blaisdell, 65, for many years a **General Electric Co.** vice president in Cleveland, died in Dallas Sept. 22. In 1945 he was made commercial vice president for the entire company, a post he held until retirement in 1950.

George R. Feine, 67, vice president and treasurer, **August Feine & Sons Co.**, Buffalo, steel fabricators, died Sept. 12.

Charles T. Posey, 38, a welding engineer for a number of years with **Arcos Corp.**, Philadelphia, died Aug. 25.

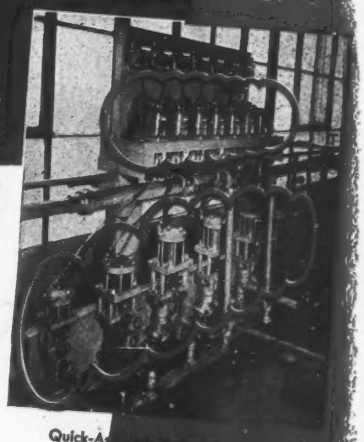
Adele H. Tirohn, 77, president, **Perfection Automatic Machine Co.**, Cleveland, died Sept. 21. She took over the concern when her husband died in 1919 and remained active in the business until last March.

Fred C. Burkhardt, vice president and chief engineer, **Crosby Co.**, Buffalo, steel stamping concern. died Sept. 13.

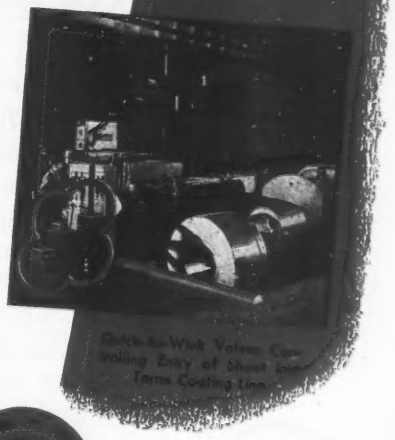
F. L. Curtis, 84, retired vice president-treasurer, **Raybestos-Manhattan Inc.**, Passaic, N. J., died Sept. 20. He retired four years ago.

Quick-As-Wink Control Valves

Quick-As-Wink Air Valves on Multiple Welding Machine.



Quick-As-Wink Valves on Hydraulic Welding Machine.



Quick-As-Wink Valves Control Rolling Entry of Sheet Into Flame Cooling Line.

synchronize and coordinate related machine operations

Those successive and inter-related machine operations — that speed manufacture and cut costs — can only be as successful as the air and hydraulic control valves you use. Specify Quick-As-Wink Control Valves. Positive and fast acting, Quick-As-Wink Valves are designed and built to meet the most exacting requirements. Danger of "repeating", major cause of breakdowns and accidents, is practically eliminated. They will deliver dependable and precision performance month after month, and year after year. Foremen and superintendents know there's nothing better than Quick-As-Wink Control Valves. Can *you* afford to gamble with less?

Quick-As-Wink

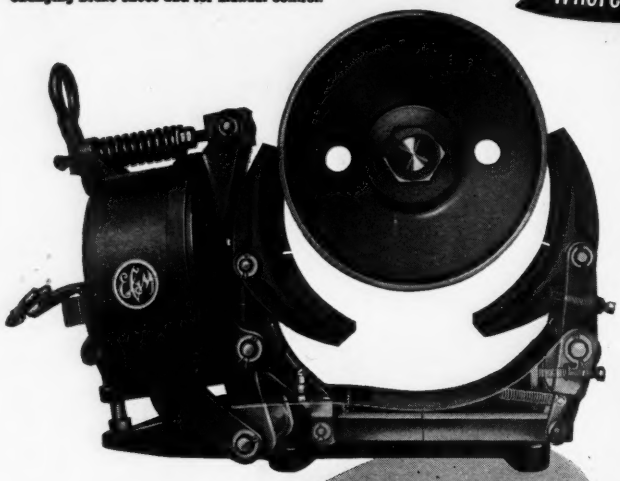
AIR AND HYDRAULIC

Control Valves

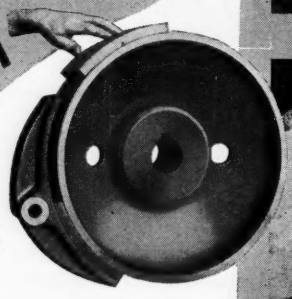
Hand, Foot, Cam, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio

Type WB Brake showing how the motor armature is easily lifted out. At top left is the handle-nut for compressing the spring when removing motor armature, changing brake shoes and for manual control.



Long Life Brakes for A-C and D-C Motors by EC&M



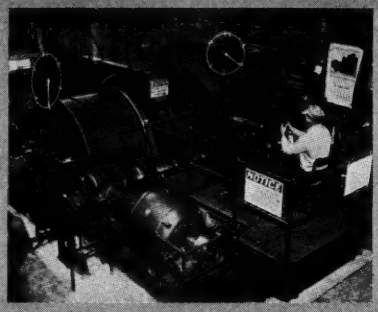
The brake lining is molded to match curvature of wheel and shoe.

Actual wearing thickness, between rivet heads and brake wheel, is 3/8" on the smallest size to 7/16" on the largest size.

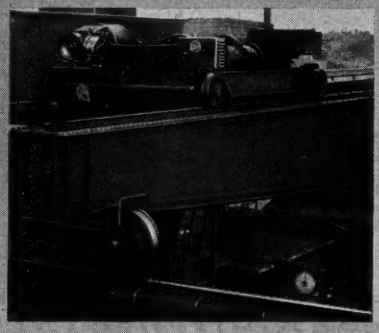
These Type WB Brakes use a block type lining which is both thick and tough.

Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.

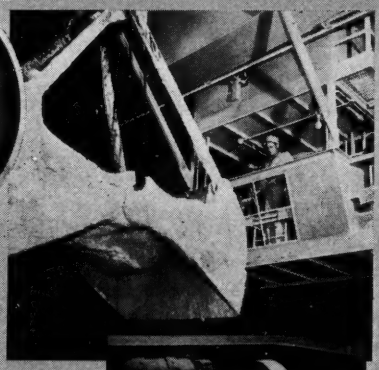
Where You Will SAVE With WB Brakes



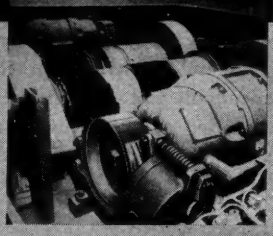
A-C Mine-Hoist Motor with WB Brake



Reduces Delays on Foundry Crane



Bucket-Crane Trolley with WB Brake



WRITE FOR COMPLETE FACTS—Ask for No. 18 ACCELERATOR Bulletin

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering
NEWS AT A GLANCE

WHERE THE TOOLS GO—Many in industry realize the aircraft field gobbles up a lot of machine tools. An idea of how many may be involved is gleaned from the statistics on new engine production presented by H. Mansfield Horner, president, United Aircraft Corp., to the Industrial College of the Armed Forces. To produce the 19XB axial-flow engines in 1947, he said, required 5250 tools. Some 13,600 tools were used to build the J-42 centrifugal-flow jets in 1948, 1949 and 1950. Already 16,800 tools are in action for the production of the J-48 jet—with more to come. To turn out the axial-flow J-57 about 20,000 tools are expected to be used.

NEW MATERIAL FROM EXPLOSIVE CHARGE—Usually what goes into the breech block of a 14-inch gun spells destruction. But the explosive response in this case plunked in industry's lap a new material for applications involving wear resistance and extremely high temperatures. The new material, cemented titanium carbide, is formed by explosive forming it in the breech of the large caliber gun. Here's how it's done: Bags of the material are first lowered into the unusual "press". The chamber then is filled with liquid, and an explosive charge that is set off electrically. The result: The new material. It's one that picks up at 1800° F where superalloys lose their muscle, providing plenty of strength at higher temperatures. p. 76

BETTER STEELS COMING— Better steels may be in the offing as the result of two studies carried out by MIT scientists for the Office of Naval Research. They point the way in eliminating porosity and brittleness produced in steel by hydrogen. One study developed an analytical technique that presents an accurate picture of the hydrogen content in steel. The other investigated the effects of different hydrogen contents on the mechanical properties of steel and how they are brought about.

POWER PLUS FOR BIG WIND—What is believed to be the greatest power output ever harnessed to a single shaft—four electric motors totaling 180,000 hp—will operate the new supersonic wind tunnel now under construction at NACA's Ames Aeronautical Laboratory, Moffet Field, Calif. The motors, ordered last year from General Electric, each weigh 145 tons and are rated at 45,000 hp. If the need arises, they can be accelerated simultaneously to produce a peak 1-hour output of 216,000 hp.

WRECKS AND TESTS—To wreck aircraft to destruction, in order to study safety factors and breaking points, is costing Douglas Aircraft about $200,000. It's building a machine, the largest static test structure outside of Wright Patterson air base, for the job. The unit is "anchored" by a 3000-ton concrete and steel foundation. The latter includes a track with 4500 drilled holes to attach hydraulic and electrically-operated jacks that can exert a force of 10,000 to 100,000 pounds in any direction.

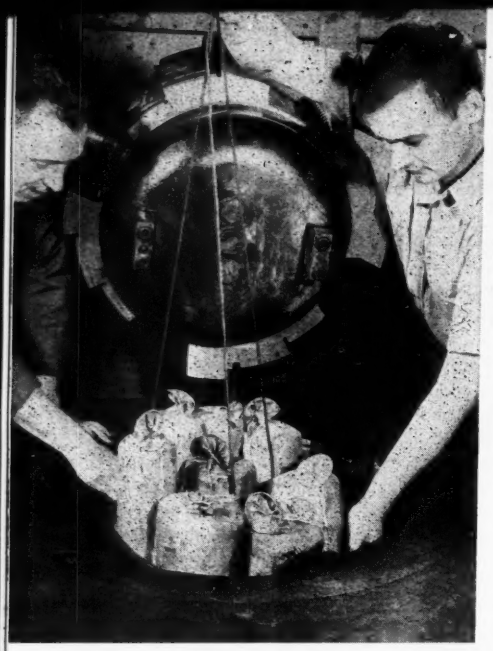
THIN STAINLESS BUTT WELDED—A condenser discharge technique perfected by workers at the Naval Ordnance Laboratory, White Oak, Md., now makes it possible to butt weld very thin stainless steel. The job is accomplished through electrical energy stored in a bank of capacitors which is discharged through transformers into the weld—in periods ranging from 0.001 to 0.010-second. With this technique, the Navy says, it is possible to weld T and I-beams with flanges 0.135-inch wide and 0.0083-inch thick with a web 0.25-inch wide and 0.0077-inch thick.

NEW FORGING TWIST—It's faster, it's a cheaper operation and quality of product is consistent. That about sums up the completely mechanized forging installation at Chrysler for continuous press forging automotive crankshafts at a rate triple to what it was before. One press now turns out the same job of four to six hammers previously needed, zooming production of crankshafts from 60 to about 150 per hour. The human element is no factor in the setup. Conveyors play a leading role in taking the billets for the cranks through shear, heating furnace, descaler, forging operations and subsequent processing. p. 78

PLASTICS CUT TOOLING COSTS—Reduction in tooling costs and a cutdown in the use of strategic metals are the results of an intensive use of plastics in production tooling at Boeing Airplane Co. Typical is a metal bonding jig, a large tool that makes possible the fixing of stress members to aircraft skin with an adhesive. Considerably lighter than the old style jig, the newcomer has added advantages in simplicity of design and manufacture. Saving per jig is figured at about $3000. B. K. Bucey, Boeing tool design manager, predicts that in 5 years a high percentage of aircraft production tools will be made of plastics.

METALWORKINGS—Wearing parts get a longer lease on life through a flame plating method of applying undiluted tungsten carbide in powdered form on almost any base metal (p. 82). Coating thicknesses on flat or cylindrical parts range from 0.0005 to 0.020-inch . . . Even flow of materials often bogs down when elevators become involved (p. 91). There's no reason for this since lost vertical motion can be avoided by a little mental action . . . A steel mill strip width gage that measures deviations as small as 1/64-inch over a range of 10 to 96 inches (p. 94) increases tonnage of usable material . . . When it comes to truing automotive propeller shafts (p. 100) dynamic machines and oscillographs team up to do the job—almost on the nose.

Metalworking Outlook—p. 39 *Market Outlook—p. 139*



Titanium carbide ingots sealed in rubber bags are lowered into chamber of old 14-inch gun for explosive pressing operation that takes place prior to final shaping

EXPLOSIVE PRESSING forms

Cemented titanium carbide shapes for variety of high temperature and wear resistant applications promise to be important additions to engineering materials

NEW MATERIALS for special applications often require unusual production techniques to get proper qualities into the finished product. The explosive pressing method Kennametal Inc., Latrobe, Pa., uses to impart uniform pressed density in its new material, Kentanium, will cause more than a slight reverberation down metalworking's alley.

The material, cemented titanium carbide, promises to have a brilliant future in applications involving wear resistance and extremely high temperatures. Kentanium's newness leaves many applications still to be determined but some uses already explored figure to take a big bite out of production.

Explosive pressing gives the material uniform density throughout. It stems from an idea proposed by Philip McKenna, company founder and president, and developed under John Redmond, vice president.

Industrial Artillery—Using the breech block and chamber of an old Army 14-inch gun, and compressing the material enclosed in rubber pouches under liquid solves what was originally a perplexing production problem. Other early attempts to press the material did not give the desired uniform density throughout the entire piece. Now the bags are lowered into the unusual press, the chamber is filled with liquid, a power charge is lowered inside and exploded electrically. It's a bang-up success.

An American patent application for the novel technique is still pending but an Italian patent has already been granted. To enable the company to press larger shapes, a 22-inch mechanism is being constructed.

In the Lead—Jet turbine blade applications are in the middle ring currently. With the emphasis on better manufacturing methods and materials in jet engine program, serious consideration is being given to large volumes of cemented titanium carbide blades and nozzle vanes. A pilot plant is already functioning at Latrobe but additional facilities will be needed as the program develops further. Two factors are equally responsible for the military's interest in cemented titanium carbide as a jet engine blade material: Shortage of alloying elements and the desirability of higher engine temperatures to improve performance and efficiency.

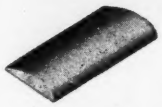
Significant Savings — Consumption of critical materials is of course a relative thing but in the event of an allout war, savings in alloying elements by making jet turbine blades and nozzle vanes from cemented titanium carbide would be significant. Produced by powder metallurgy techniques, Kentanium uses 30 per cent nickel by weight as the auxiliary or binder material. Cobalt also was used earlier as the binder but nickel took over exclusively. It offers superior high temperature properties. Additional resistance to oxidation is gained by a small addition of columbium tantalum carbide, as much as forty-fold over straight titanium carbide.

To obtain higher jet aircraft speeds and improved fuel economy, engine temperatures are going up. Raising the inlet temperature from 1500 to 2300°F, for example, would triple the power. Fuel economy of a gas turbine improves sharply from the 1500°F attained in current production models to about 2200° F, where it levels off.

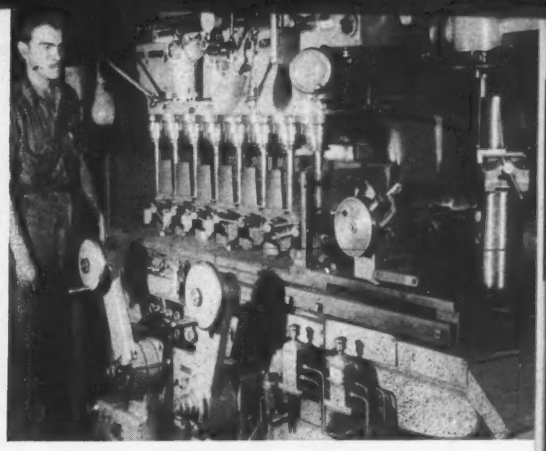
Fire Power—Production engines with inlet temperatures of 2000°F and higher are still in the future but engine designs calling for 1800°F are at hand. At this temperature the superalloys lose their muscle and fall by the wayside but titanium carbide remains strong.

Carbides are generally classified as brittle materials and titanium carbide cannot be considered an ex-

A few shapes produced to date by pressing or extrusion give some indication of variety of parts produced from cemented titanium carbide



By ED KARPICK
Associate Editor



Machining operation for shaping foils of jet turbine blades prior to final sintering traces eight blades simultaneously from the master

new material

ception to the rule. The material has a low ductility but it has a measurable deformation at room temperature. Stress-rupture elongation is about 2 per cent at 1600°F and slightly greater at higher temperatures.

Basically Kentanium is produced by ball milling of the metal powders, pressing of the mixture, further shaping with or without presintering and final sintering in the absence of air. During final sintering a shrinkage of about 20 per cent occurs.

Pressing Problems—Because of the high compressive strength of the carbide particles and poor flow characteristics, the complexity of pressable shapes is severely limited. For such shapes as turbine blades, bushings, nozzles and other complex forms the equivalent of ingots are pressed and then machined by a conventional method allowing for shrinkage. A pressed rough shape or block is large enough to yield several turbine blades, for example, and is then cut to a rectangle of the right size on a diamond-tipped band saw.

Some parts can be machined after pre-sintering without special difficulty and close enough limits can be maintained so grinding is not necessary after final sintering. Final parts can be held within 1 per cent through final sintering despite the large shrinkage. Foils of jet turbine blades shown during machining on a Cincinnati Hydrotel do not require grinding after sintering although the root is ground to finished size because of critical fit required. Although the part has the consistency of chalk during the machining operation, the grains are abrasive so diamond abrasive wheels are used and care must be taken to make sure machine ways are kept clean.

Consideration is being given to the development of a special machine to do the job now being done on the Hydrotel. Ease of forming the material in the powder state will permit lower horsepower and higher tracing speeds than available in standard models now being used. The 360-degree tracing feature will be retained.

Deep Are the Roots—Designs suitable for more ductile materials may not work with titanium carbide. The pine-tree roots used on jet turbine blades, for example, weren't suitable. Changing to a bulb-type root eliminated failures. Similar consideration must be given to other designs using large radii and other stress relieving means to obtain maximum potential of the material. As more and more applications are tried out a mass of information is being accumulated to guide designers in specifying new uses.

Extrusion similar to that used in ceramics permits the rapid forming of uniform cross sectional shapes to close dimensional limits. This technique is particularly useful for making tubes and rods. Hot pressing and other methods for direct molding shapes are under development.

Resistance to heat, thermal shock, oxidation, wear and relatively light weight give titanium carbide a wide field of application. The material weighs about one-third as much as tungsten carbide and about two-thirds as much as the super-alloys.

Hot Rodders—Cutting tool applications to replace tungsten carbide are not contemplated except where heat is excessive. Hot spinning tools, hot forging dies, tools for trimming flash from welded tubes and like applications have already passed tests-by-fire because of titanium carbide's superior oxidation resistance. The same consideration applies to high temperature applications of sealing rings and bearings.

Some other areas where titanium carbide has successfully qualified in field trials are: Brinell balls for hot hardness testing at 1350°F, disks used as anvils in resistance welding applications, oilwell ball check valves, pressure reaction vessels capable of withstanding an internal pressure of 30,000 psi at 2300°F and hot spinning tools for steel tubing.

Reciprocating engine valves and valve guides are another promising application. With respect to wear resistance and valve attack, Kentanium valves have shown marked superiority over sodium cooled superalloy valves.

The Gamut—Manufacturing experience to date includes: Tubes up to 36 inches long and ¾-inch in diameter, nozzles up to 5 inches in diameter by 6 inches long, hot extrusion die inserts, numerous types of test specimens, ball.

Completely mechanized installation for continuous press forging of automotive crankshafts proves its merits by high production, consistent quality

By H. C. TUTTLE
Detroit Editor

Work moves from high speed, mechanical forging press at left to subsequent trimming, upsetting and aligning operations precede delivery to heat treat and tempering process

NEW FORGING TWIST

Crankshaft Output Tripled

"GLORIFIED BLACKSMITHS, that's what we are," says Al Gostow, as he looks around the new crankshaft press shop at Dodge Division's forge plant in Detroit. The forge plant's husky young manager looks the part of a blacksmith and in fact has come up through the ranks as a forging hammer man. His smithy, however, is unlike any other. Forging is mechanized and automatized to the nth degree. Even the noises in it are not those normally associated with the forging operation.

In an industry as thoroughly conveyorized and automatically controlled as automaking is, forging as generally practiced has had few of such benefits as iron hands or transfer machines. The smoky hot forging operation isn't usually one to show visitors. But Chrysler Corp.'s new shop proves the place for infernos is in books by Dante.

Costly Vision—Continuous press forging of crankshafts was visualized back in the '30s by Grover Eads, then manager of the Dodge forge plant. The monumental investment required for a plant of this type and other considerations postponed the decision to build and equip such a facility until after the war, when the go-ahead signal finally came.

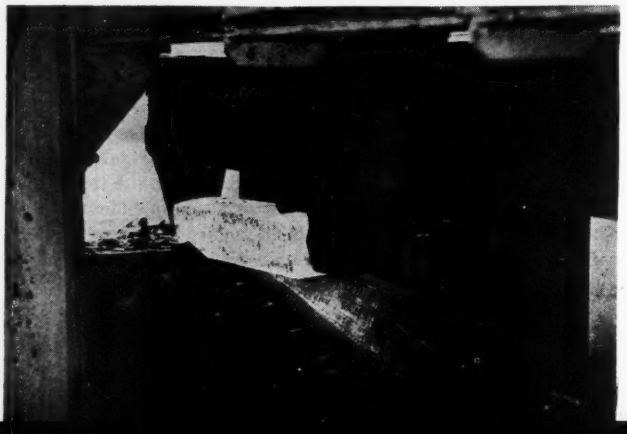
Two years ago ordering of the equipment began, and for the last year bugs which are the natural companion of a previously untried manufacturing method have occupied engineering exterminator squads. Now, however, the continuous press forging process has proved its merits, and, according to Mr. Eads and others who have compared it to the hammer forging technique, may eventually supplant that type of blacksmithery.

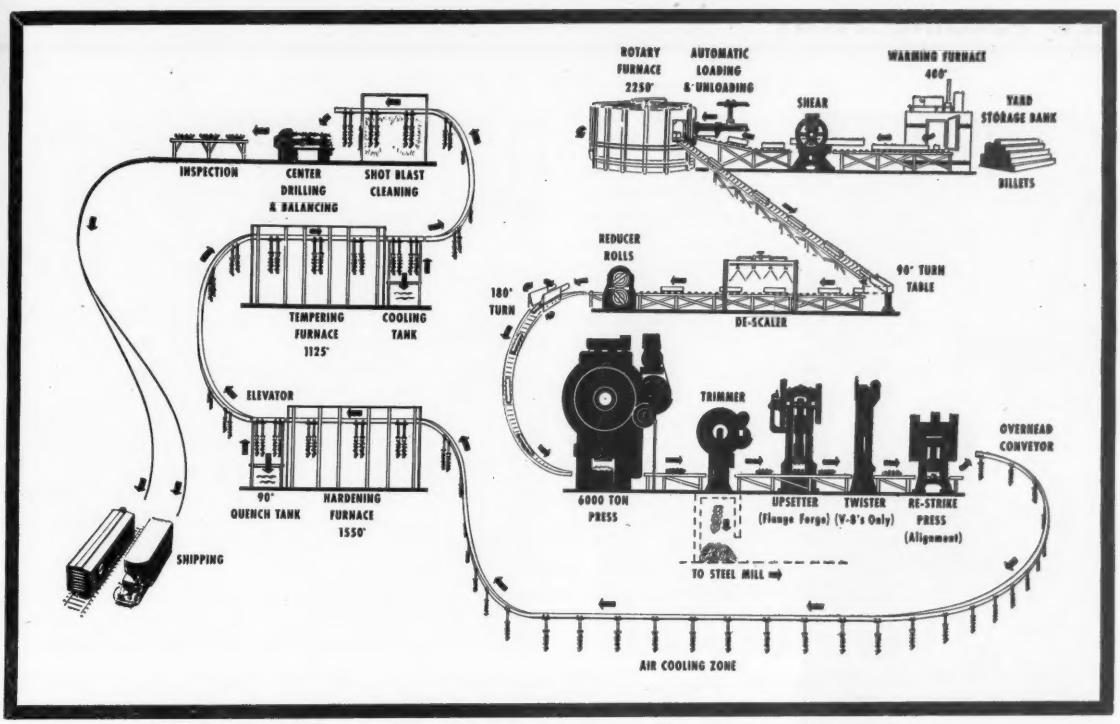
No Loose Talk—With typical automakers' reluctance to disclose figures of aid and comfort to the rivals, the forge plant's people are not willing to cite cost advantages of the continuous press forging operation. Production, however, is elevated from the 60 cranks per hour achieved by the hammer forging method to 150 an hour. One press can form the large counterweights required on V-8 engine crankshafts, whereas four to six hammers would be needed.

Operation of the press—run by a 400-hp motor—is said to be much cheaper than a steam hammer. Hourly rates for press operators are about 20 per cent lower than for hammer men. Mr. Gostow says roughly 25 per cent improvement in manufacturing efficiency over hammer forging is possible through use of press forging. Another important benefit is consistent quality, the human element which makes the hammer man an artisan being eliminated in the press operation.

Die costs are comparable be-

Automatic unloading hands remove a billet heated to 2250°F from rotary heating furnace. Billets do not slide over furnace floor





Progress of a steel billet from the storage yard until it is shipped as a finished crankshaft forging is depicted in a schematic drawing of new plant

tween the two procedures. In dies for press forging, however, a good deal of exploration is still ahead, and Dodge men say there is a lot to be learned on this score before there are final answers.

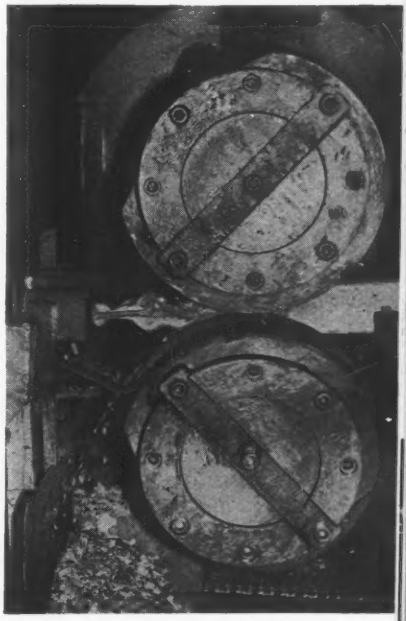
Not So Simple—Continuous press forging as practiced by Dodge entails considerably more than putting a hot steel billet into a press and squeezing it into crankshaft-shape. If this were all there were to it the press could have been set up in any idle corner of the forging shop. Instead, a completely new building 150 x 462 feet was designed to house the project. This is oversize; it permits installation of two more sets of presses and billet heating furnaces. The second line is now going in, and equipment for the third is on order.

From start to finish — from standard billet of 1045 steel to V-8 crankshafts of 415-500 Brinell hardness centered and balanced and ready for machining—the Dodge press forging operation consists of these steps:

Operation Starts—Billets, stored outside the plant, are lifted by magnet crane to a rack in the plant wall. They are pushed hydraulically through a warming furnace. This furnace is used principally during cold weather to warm the steel to as high as 400° F to avoid cracks in shearing.

Emerging from the warming furnace, the billets fall to a conveyor which moves them into a 1300-ton Buffalo shear, actuated by a trip. The shear cuts the 4-inch square or slightly larger billets into pieces ranging in weight from 106 to 125 pounds, depending upon the kind of crank to be made.

Easy Does It—Then by conveyor parts move to the rotary furnace. At this point individual pieces are picked up automatically from a small elevator by a hydraulically operated, jaw-type arm and lifted into the furnace. This loader gently lowers them to the furnace floor, thereby saving wear and tear on the floor. Loading can be preset so that as many as 300 billets can be carried through the furnace in an hour. This Hagan doughnut-type rotary furnace measures about 32 feet in diameter, is gas-started and oil-fired. Burners play from both sides toward the billets. Tem-



Billet passing through reducer rolls has shape changed for forging operation

Pushed end-over-end by air driven piston, reduced crankshaft billet is now in position to enter the forging press

peratures are automatically held between 2250 and 2300° F.

Each loading action is followed by sufficient movement of the furnace floor to provide space for the next billet. This process is continuous, about an hour being taken up by the heating cycle. The entire operation is electrically synchronized, hydraulically and mechanically actuated.

Unloading, which takes place adjacent to the loading station, is performed by a similar jaw-type mechanism, operating in reverse. The heated billets, after removal from the furnace, slide on a gravity conveyor to a turntable which rotates them 90 degrees. They are then conveyed through a four-jet water descaler, operating at 1500-2000 psi.

Billets next go through a reducer of Dodge's design which by rolling distributes the steel—a procedure which in hammer forging would be done in the hammer. As the reduced billets emerge they intercept a photoelectric cell which actuates an air-piston to turn the billets end-over-end 180 degrees. A conveyor then brings the billet to the main press.

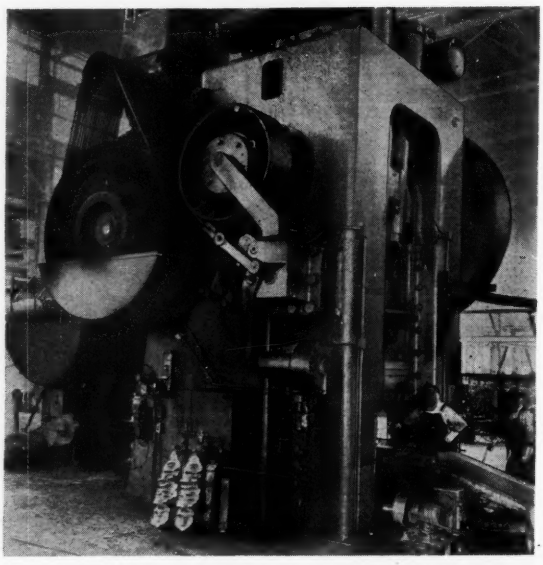
Keeps Moving — This 6000-ton Ajax mechanical forging press is capable of more than 35 strokes a minute. The billet, positioned by the press operator, is given two die strikes in separate dies. The operator then pushes the forging to a conveyor on the opposite side of the press.

It then enters the die of a Clearing trim press. After being struck, the forging is pushed out of the trimmer by an air cylinder. The flash is dropped by the operator through an opening in the floor onto a conveyor which carries it out of the plant and into a waiting gondola car. A carload of scrap is generated daily.

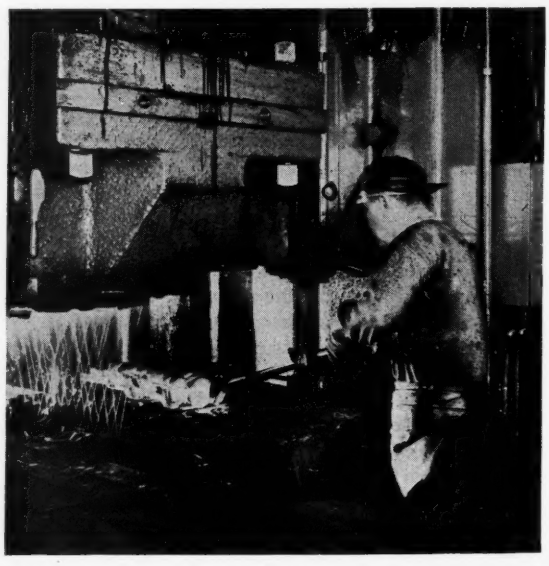
Using tongs and assisted by an overhead trolley, the next operator then places the forging — now weighing 66½ to 93 pounds depending on type—in a 4-inch Ajax upsetter for flange forging.

Sixes and Eights—In the case of forgings for the V-8 crankshaft, the material is forged flat. The crankshaft then goes into a hydraulically operated Clearing machine which twists it to bring the crankpin bearings in proper alignment.

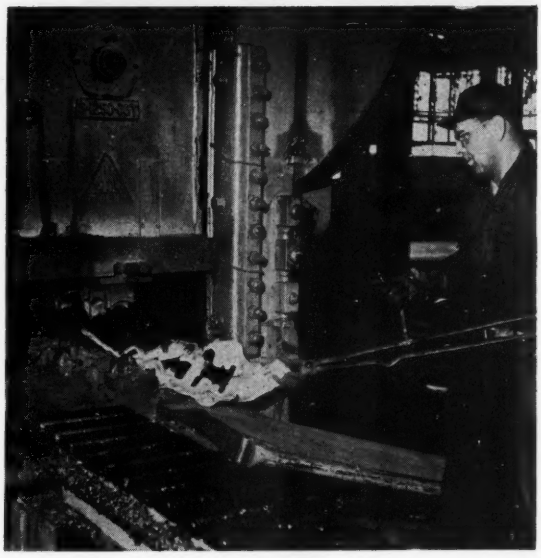
Cranks for the six-cylinder engines are forged in proper align-



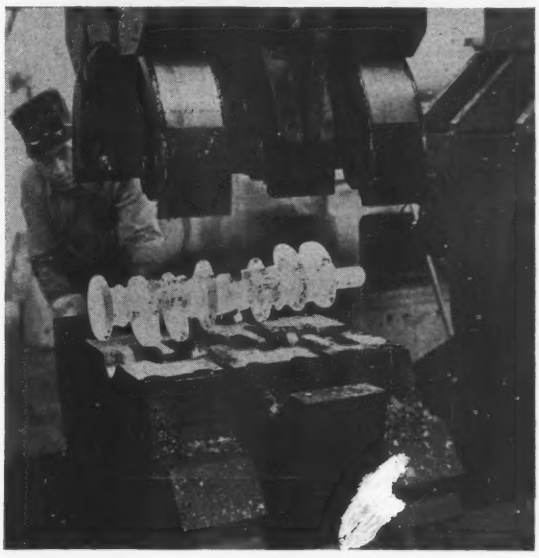
Closeup of 6000-ton forging press with which Chrysler has developed its continuous press forging of auto crankshafts



Only two strikes, one on each of two dies, were required to forge the crankshaft the operator is handling in photo



Operator removes trimmed material and puts it on slide where it drops through floor opening on way to scrap pile



V8 crankshafts are forged flat and then twisted on machine above to place crankpin bearings in proper alignment

ment and do not require this twisting operation.

From this step, the forging next goes to a Clearing press for restrike for straightening. After this step forging is moved, again with trolley assistance, to a specially designed rack which receives the crank in a horizontal position and drops it to the vertical to be picked up by an intermittently operated overhead conveyor. Then it moves through an air cooling zone before being taken to the heat-treating furnace.

Flexibility Too — Before heat-treat, the forgings are transferred to alloy-steel monorail carriers, each of which hold four crankshaft forgings, suspended vertically. This vertical position, used for hardening, tempering, quenching and shot blasting operations, is unique and permits a great deal of flexibility in the length of parts which can be handled. Because only one end of the part is held, savings in high alloy parts (Inconel for the hook which enters the water quench, for example) is achieved.

An air hoist elevator takes the carriers to a supply station where in groups of two, holding a total of eight cranks, they are ready to move into the furnace. The carriers enter the Holcroft hardening furnace at intervals of just over 3 minutes, leaving it about 100 minutes later after the forgings have been subjected to 1550° F. This type of furnace is frequently used for ceramic work at lower temperatures, but, according to Dodge men, has not previously seen automotive service.

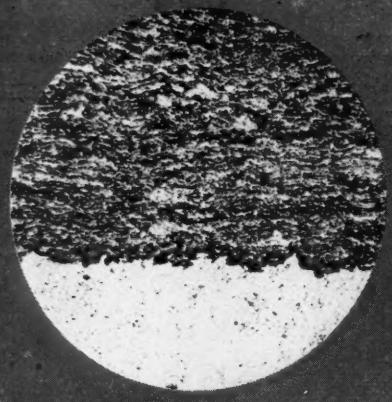
On emerging from the furnace the carriers are lowered, ducking the forgings in a tank of agitated water held to 90° F. The quench lasts 70 seconds. Scale dropping off the forgings in the tank is automatically and continuously removed by conveyor and dropped into a movable hopper.

Riding Along—From the quench the carriers rise to the monorail again and move into a gas-fired tempering furnace, again at 3-minute intervals. Still in pairs the carriers move through the tempering furnace in 120 minutes. Temperature is held at 1125° F.

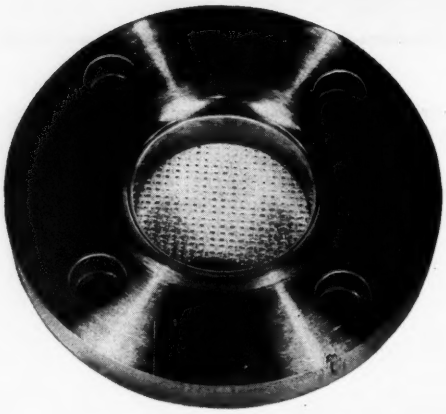
As the forgings emerge they are lowered into a tank of cooling water, then raised and returned to the monorail for movement to the Wheelabrator shot blasting cabinet for automatic cleaning. From this operation they are removed from the monorail to a conveyor which takes them to a machine for centering drilling. A subsequent alignment operation by another press straightens the crankshafts to static balance on live centers. After gaging and inspection for hardness and flaws, they are ready for shipping.

Handling Pared — Whole operation takes 7 to 8 hours. Up to the press there is no manual handling of the heated billets. And after forging they are handled only once, when transferred to the carriers for heat treating, until they are removed after shot blasting. The press operation itself is performed by a 12-man crew.

Besides mechanical aids to reduce human exertion in the entire process, careful attention has been given to exhausting the fumes at the forging press and providing a centralized forced fresh-air system with individual outlets at each work station where the hot billet or forging is handled. Al Gostow's glorified smithy needs no spreading chestnut tree overhead.



Dark area, flameplated tungsten carbide coating. Lighter zone is mild steel base. Jagged bond line shows cleaned, slightly roughened surface that was coated



FLAME PLATING: Wearing Parts Get L

New method applies undiluted deposit of tungsten carbide on almost any metal. It widens horizon for designers, makes down-time due to severe abrasion a rarity

DESIGN engineers are given a little more latitude in coming up with lighter components, and manufacturers a way to reduce down-time due to wearing parts by a new flame-plating process reported by Linde Air Products Co., New York.

The method is one that applies an undiluted deposit of tungsten carbide, in powdered form, on almost any base metal, providing coating thicknesses ranging from 0.0005 to 0.020-inch. It can be used to coat flat areas, cylinders, holes and parts having various shapes in which the user is seeking protection from severe abrasion and frictional wear — precision components where the wearing away of a few thousandths of an inch of metal would make the part useless.

Properties Unchanged—Biggest advantage of the process is that the temperature of the base metal does not exceed 400°F during the plating operation—even when tungsten carbide is being deposited. This low temperature practically eliminates any possibility of a change in the properties of the metal being plated, reducing to a minimum the chance of the part warping. The plated part can be used as-coated, or ground to a mirror finish.

Metals other than tungsten carbide have been deposited by the new process, but to date, bulk of the development work and greater portion of the field testing has been accomplished with tungsten carbide.

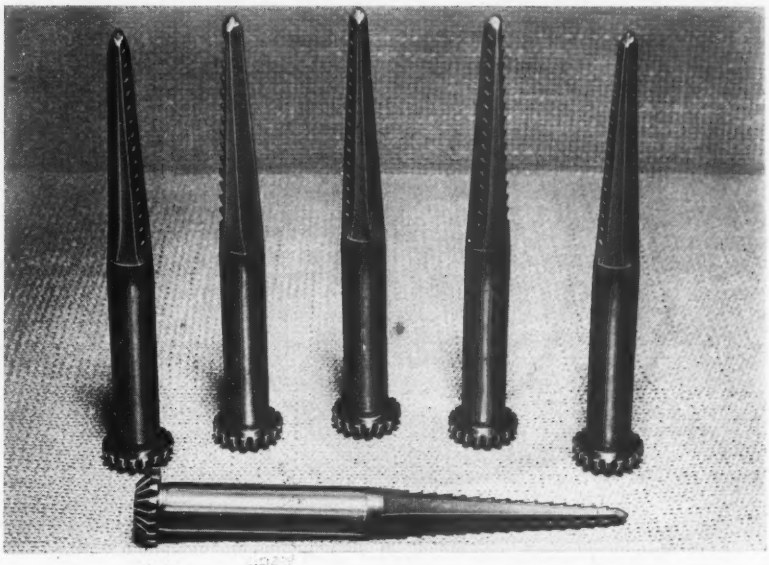
Designers Helped Two Ways—Wide selection of base metals that can be coated by the new process makes it especially interesting to the design engineer. He may, for example, require a part that has good electrical conductivity, but at the same time must resist surface wear. He can now obtain both by flame-plating copper. If he's faced with the problem of reducing weight of a wearing part, his answer might be flame-plating aluminum or magnesium.

A number of factors determine when to use the process. Cost of flame-plating a part, in actual dollars and cents, falls somewhere between the cost of a hard-faced part and a sintered tungsten carbide. A flame-plated plug gage, for example, will cost more than a gage of cast alloy, but less than one made of sintered tungsten carbide. But the outlay of dollars must be balanced against the service life. Very often the time and money a long wearing part saves by reducing down-time for maintenance and repair more than offsets its initial cost.

The Plus Advantages — Parts flame-plated with tungsten carbide have all of the desirable properties of sintered tungsten carbide such as resistance to abrasion and frictional wear and, in addition, a lower modulus of elasticity, and greater resistance to impact and thermal shock.

Part sizes that can be flame-plated are limited by the handling equipment available at the present time. These limitations are expected to be relaxed as equipment is improved. Areas that can be coated vary with the shape of the

Inner lip of this cup drawing die has small area, but must resist an exceptional amount of wear. Flame-plating produced 0.003-inch thick coating



When these cotton-picker spindles rotate about 2000 rpm, sand in the balls wears steel barbs down. Protection is provided by 0.001-inch thick coating

et Longer Lease on Life

part. Here's what can be done now:

Flat sufaces 6 inches wide and up to 40 inches long are flame-plated in thicknesses up to 0.020-inch, providing the part is to be used in the as-coated condition. If it is to be finish-ground, width limitation is ¾-inch.

Cylindrical objects from ⅛ to 6 inches diameter can be handled with present equipment. Smaller or larger diameters may be plated but these would require special handling. The limitation on length is 40 inches.

Holes or internal areas of cylinders can be plated to a depth equal to the diameter. A 1-inch hole can be plated to the same depth.

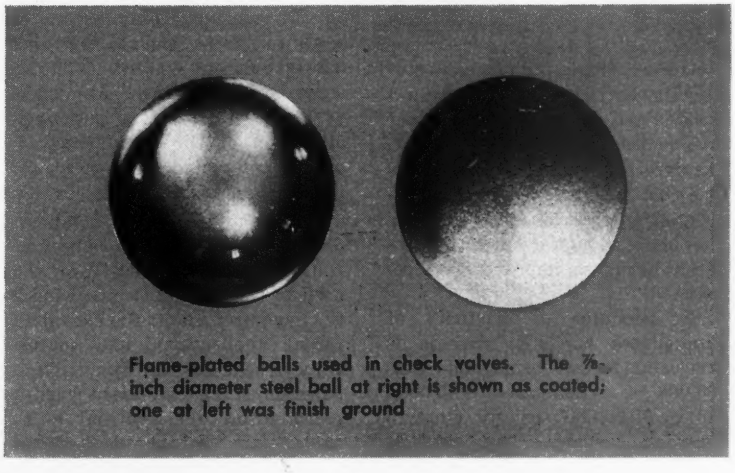
Irregular-shaped objects also are handled. The width and length limitations are the same as for cylindrical and flat areas. Any area that can be covered directly from the horizontal plane to an angle no greater than 45 degrees from the horizontal can be successfully flame-plated.

Parts Are Undercut—Parts to be flame-plated are undercut just deep enough to allow for the desired thickness of the coating. A small protective lip is left at any edge where the part may be subjected to abuse or where two flame-plated surfaces are at right angles to each other. This is especially important on plug gages, shafts, spindles and core rods.

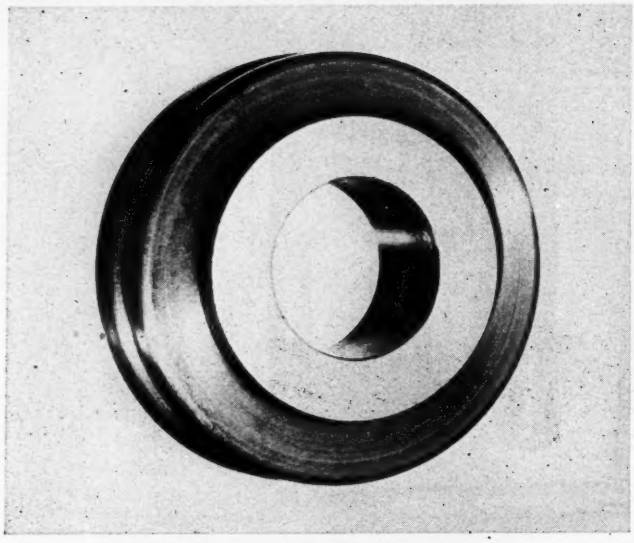
Although maximum thickness obtainable with a flame-plated coating is 0.020-inch, few applications would require a thickness of over 0.005-inch. A coating thickness of a few thousandths of an inch will resist mechanical and thermal shock to a much greater degree than will a thickness of 0.010-inch or 0.020-inch.

If the part is to be finish-ground an excess coating of 0.004-inch is deposited. However, it may be desirable to use the as-coated surface. This surface is 125 micro-inches rms, as measured by a Brush analyzer.

Finish Grinding—A flame-plated surface can be ground to a finish of approximately 2 microinches rms. The surface of a coating that



Flame-plated balls used in check valves. The ⅞-inch diameter steel ball at right is shown as coated; one at left was finish ground



Wearing surfaces of mechanical shaft seals are easy to coat. This one was coated on its wearing face only—then highly polished

has been finish-ground appears to have a certain amount of microscopic porosity. These surface pores are extremely shallow and do not have a detrimental effect on the wear qualities of the coating.

Tungsten carbide currently applied by the flame-plating process is composed of tungsten, carbon, and 8 per cent cobalt. The elements are present in forms differing from sintered tungsten carbide. The particles forming the coating are elongated and flattened into thin disks. The diameter of each particle is many times larger than its thickness.

Bond Not a Weld—Microscopic examination indicates that the bond between the parent metal and the coating is not a weld. There is no mixing or dilution of the coating material with the base. Even though there is a distinct boundary between the coating and the base, there is no void or visible oxide layer.

Currently it is believed that in order to separate the coating from the base, the base must be deformed. If the coating is thin when the base is deformed, the coating will crack vertically, but will adhere to the base between the cracks. If the coating is thick, the coating will tend to separate from the base.

Critical thickness above which separation occurs depends on the nature of the base, its hardness and surface preparation. The bond is better with the softer metals such as aluminum than with extremely hard metals such as chromium.

Practically all commercial metals and alloys including hardened tool steel can be coated satisfactorily. Chromium plate, sintered tungsten carbide, and ground flame-plated surfaces cannot as yet be coated with good adherence. Because the coating does not mix with the base metal, properties of both the base and the coating are retained. The hardness of flame-plated tungsten carbide coatings averages about 1350 Vickers pyramid number (VPN). This is equivalent to 89.3 Rockwell (A scale).

Harder Than Indicated—Actually, the particles that make up a flame-plated coating are harder than indicated by the Vickers test. The difference between actual (particle) hardness and apparent (coating) hardness is due to the bond. This bond, though it lowers the apparent hardness, improves wear resistance.

The modulus of elasticity of flame-plated tungsten carbide is surprisingly low, being only 15,000,000 psi as compared to 85,000,000 to 90,000,000 psi for sintered tungsten carbide. This extreme difference also is attributed to the unique bond.

A low modulus of elasticity is advantageous for materials used to resist frictional and abrasive wear. It means that even a light load will cause slight deformation of the coating. The load will, therefore, be distributed over a larger portion of the bearing surface. This, in effect, means a smoother wear surface.

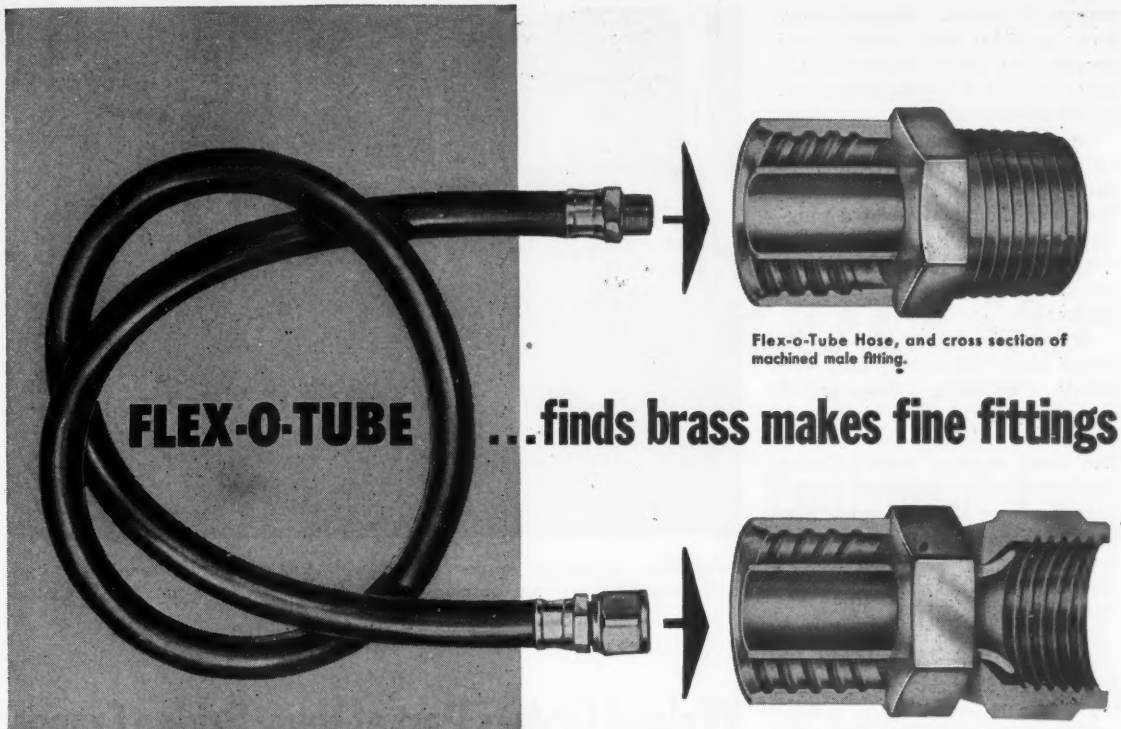
The low modulus is desirable for another reason: Any load applied to a ductile base material will cause deformation. A low modulus coating will also deform—to a limited degree—rather than tend to retain its original shape and crack.

Porosity Negligible—In contrast to many other types of coatings, flame-plated tungsten carbide has a negligible amount of porosity—less than 0.5 per cent. Due to the thinness of the coatings no accurate measure of their tensile strength has been made. The coating material is supported, however, by the base metal over which it is applied.

Reagents that attack tungsten carbide or cobalt will attack flame-plated coatings. But mild alkalies, detergents in lubricating oils, and atmospheres free from acid fumes have no detrimental effect on the coating.

Its Shock Resistance—Because of the bond between individual particles, low modulus of elasticity, and thinness of coating, the stresses induced in flame-plated tungsten carbide by a given temperature differential are low. Thermal shock of a moderate rate and below about 2000°F has no effect on the coating. For mechanical shock resistance, the coating thickness should not exceed 0.003-inch after finish grinding. Any shock or impact that causes permanent distortion of the base piece, impairs flame-plated coatings regardless of coating thickness.

Results of the tests conducted on flame-plated parts have been encouraging. Over 100 core rods used in the powdered metal industry have been plated for use on different applications, and successfully tested in the field. These parts must be extremely hard to resist severe abrasion and, at the same time, withstand a certain



Flex-o-Tube Hose, and cross section of machined male fitting.

FLEX-O-TUBE ...finds brass makes fine fittings

Cross Section of machined and flared female fitting.

For quick, accurate and economical machining, free-cutting brass rod is preferred by many companies, such as Flex-O-Tube, Division of Meridan Corporation, Detroit, Mich. This company makes hose assemblies and fittings to conduct air-oil-water-gasoline and hydraulic power for the automotive, farm implement, machine tool and aircraft industries. Some of these hoses have a minimum bursting pressure of 20,000 pounds per square inch, which gives an indication of the tightness required, which can be obtained only by strength and accuracy.

Flex-O-Tube has found six points of superiority for brass over other metals, as follows:

1. Brass "flows," or is ductile, so that no cracks result during the crimping operation required to fasten the fittings to the hose.

2. Ductility and strength inherent in brass act to provide a superior seat to fittings designed to control fluid flow. Competitive metals are either too hard or too soft to give positive closing and tend to leak.

3. Where the design of the fitting is intricate, necessitating removal of considerable metal by machining, the automatic screw machines can be run faster with free-cutting brass rod.

4. Brass has a high scrap value, and the scrap sold back to the mill increases brass supplies.

5. The break-even point between brass and other metals is especially favorable to brass in the sizes of rod that Flex-O-Tube buys.

6. Customer preference is for brass, which is universally recognized as a quality metal. Hence brass fittings are more readily sold, and in fact often are specified regardless of size or price differentials.

Included in the Flex-O-Tube operations are machining, flaring, crimping, and annealing to assure the proper ductility for flaring and crimping.

Revere is an important supplier of brass rod to Flex-O-Tube, and has also collaborated with this customer through the Revere Technical Advisory Service.

If you wish information about brass and how one or more of the Revere brasses can add to the economy and saleability of your product, get in touch with the nearest Revere Sales Office. See your telephone directory or write direct.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

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Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities. Distributors Everywhere.

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amount of shock. Sintered tungsten carbide rods were hard enough, but broke frequently because of the inherent brittleness of this material.

Saves $350—One user reported he saved $350 by switching to flame-plated rods. The reason was that even though the plated tungsten carbide also has inherent brittleness, the steel core absorbed the shock, while the coating withstood the wear.

An extensive wear test was conducted on 14 different gaging materials, including flame-plated tungsten carbide. The tests were conducted over a 2-year period. The wear medium was cylinder block cast iron. The flame-plated gage out-wore all other materials. It showed a life of about 5 to 1 over a gage made of boron carbide and 3 to 1 over sintered tungsten carbide.

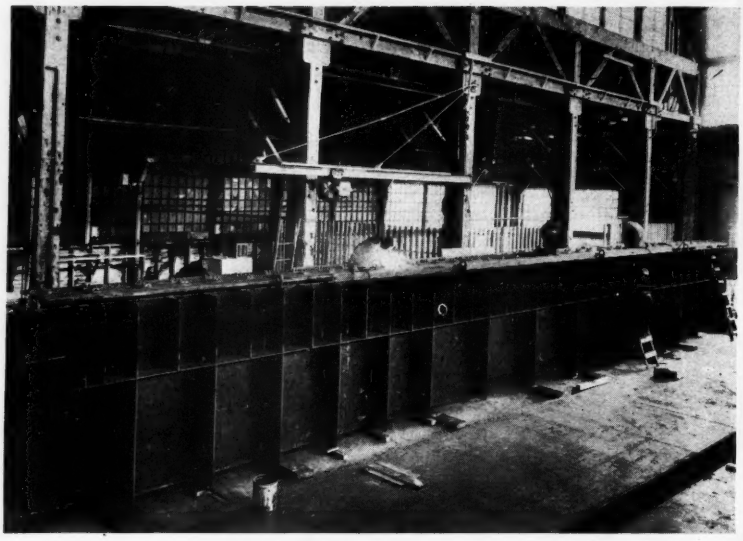
A flame-plated burnisher produced 80,000 parts in an automobile plant. The test ended when the burnisher broke due to a misalignment of a steering knuckle. After checking the tool, the user stated that if the accident had not occurred, the burnisher would have produced an additional 100,000 parts.

Other Applications—A 14-inch hollow-ground flame-plated circular saw is now undergoing tests in a lumber mill. The blade, in use for two weeks, is reported to be cutting as good as when it was initially installed. Previously used steel saws had to be resharpened every week.

Several applications involving flame-plated shafts, spindles, bearings, and bushings are being tested in the field. These tests have not been completed. However, indications are that these applications are very adaptable to flame-plating.

A flame-plated draw die operated successfully through the drawing of 23,000 steel cylinders without showing any appreciable wear. The average life of a steel die is 5000 to 8000 drawings.

Other parts that are on test now include valve plugs, seat rings, balls, mill hammers, cut-off dies, punches, bearing seals, card fingers, molding fingers, lathe centers, centerless grinder rests, burnishing rollers and pump plungers.



Fabrication of 46-ton girder begins with tacking of horizontal rib and transverse stiffeners into position on the web; welds are on 6-inch centers

Welded Girders Part of Huge Bridge Cranes

Girders for the two 350-ton bridge cranes under construction for McNary dam were fabricated largely by continuous seam welding. Alignment checks showed no distortion

OUTSIZE 46-ton girders for each of two 350-ton bridge cranes under construction for McNary dam were fabricated largely by continuous seam welding at Willamette Iron & Steel Co., Portland, Oreg. Each crane totals 280 tons.

With the exception of tie beam connections, walkway sections, bumpers, and caps—bolted or riveted during erection—all girder parts were welded, principally with ML-1 and ML-2 Lincolnweld machines. Alignment was carefully checked upon girder completion and no distortion was found. The type of welding used also reduced overall welding costs, and permitted greater flexibility.

Girders are 80 feet and 2 inches long with a web depth of 9 feet 2¼-inches of 9/16-inch plate. Top flange is 44 inches wide of 2-inch plate and bottom flange is 29 inches wide of 2-inch plate.

Here's How—Fabrication began with tacking of horizontal rib and transverse stiffeners into position on the web, then intermittently welding with 3-inch welds on 6-inch centers. Top and bottom flanges were butt welded to make up length, three passes on each side, ⅜-inch land. Flange stiffeners, 40 feet by 8 inches by 2½-inches, were positioned at 45-degree angle and welded with manual hidden arc process at the rate of 10 inches per minute on each top flange.

Top and bottom flanges, again with 45-degree positioning, are then welded with hidden arc, two passes at 14 inches per minute, to the webs. Webs were beveled at 45 degrees, ¼-inch land, and the welding done after 1 x ¾-inch back-up bars were tacked to the inner web sections.

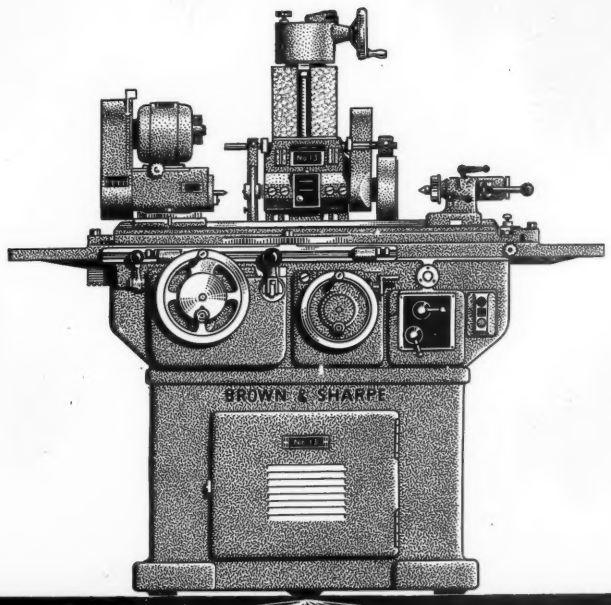
On the four beams, 16 two-pass, automatic welds were run continuously for the 80-foot girder length. The 14 web stiffeners on each beam side were intermittently welded to web and flange, 4-inch on 12-inch centers.

B·S

Productioneered

Equipment for Toolroom Grinding

With today's heavier production demanding more and faster tool sharpening and other regular toolroom grinding jobs, there is a constant risk of toolroom "bottlenecks". That is where Brown & Sharpe Machines and Tools can help. This modern equipment is especially designed with broad aspects of plant production in mind . . . "*Productioneered*" with simplicity, flexibility and lasting accuracy to keep production flowing continuously.



B·S *Productioneered*

for complete cutter and tool grinding service

NO.10N CUTTER AND TOOL GRINDING MACHINE

WITH UNIVERSAL OR PLAIN EQUIPMENT

The No.10N with Universal Equipment (illustrated) is a fast, accurate machine for complete cutter and tool sharpening, plus light cylindrical, internal and surface grinding. Roller-bearing table and simple, convenient controls are typical of many easy-handling features. The same basic machine with Plain Equipment provides equally high performance for cutter and tool sharpening only.

Brown & Sharpe

B·S Productioneered
for unusually broad utility

No.13 UNIVERSAL AND TOOL GRINDING MACHINE

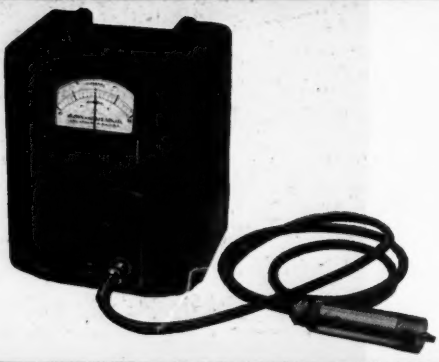
Most versatile of the Brown & Sharpe grinding machines, this model is designed primarily for broad utility in the toolroom — but can also be speedily set up to care for limited over-flow of manufacturing work.

No.5 CUTTER AND TOOL GRINDING MACHINE

Especially designed for fast, efficient sharpening of cutters and tools — particularly smaller cutters and end mills. Additional equipment is available to further speedup sharpening in quantity.

B·S Productioneered
for quick sharpening of tools and cutters

B·S Productioneered
to expedite high level output

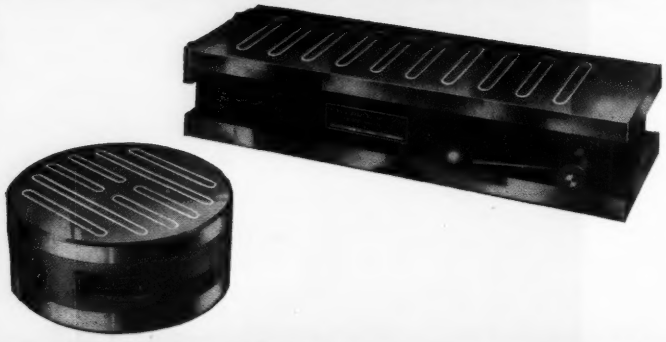


ELECTRONIC MEASURING EQUIPMENT

This Brown & Sharpe Electronic Equipment permits precision gaging and inspection, at high speed, with human error practically eliminated.

It amplifies gage measurements 1800 to 18,000 times, enables operators to read ten-thousandths as easily as inches, as fast as parts can be handled. Invaluable in maintaining uniform quality at high output.

B·S Productioneered
to save operators' time



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Brown & Sharpe Permanent Magnet Chucks make the most of the skilled machinist's time by simplifying work-holding problems. A quick shift of a lever engages or disengages magnetic holding power. No electrical connections, no operating cost, nothing to cause heating. Clamps, vises, jigs and fixtures eliminated for many jobs. Wide variety of rectangular and rotary models available.

B·S Productioneered
as aids to higher output

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Brown & Sharpe Vises promote fast production through the quick, accurate setting and secure holding of precision work for milling, grinding or drilling — often eliminating the need for expensive jigs or fixtures. Made in Plain, Flanged, Swivel, Cam and Toolmakers' types.

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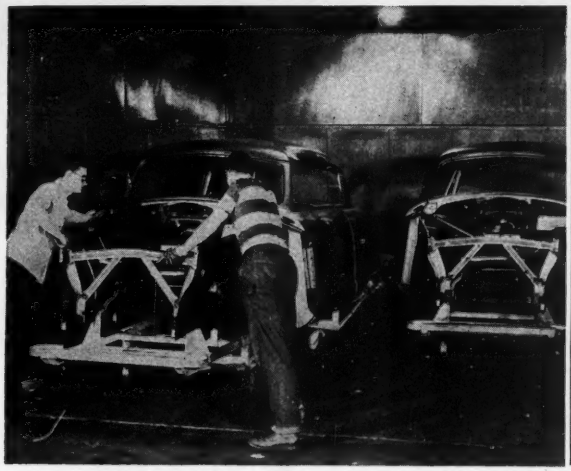


Special wheeled dollies are used by the Nash-Kelvinator Co. to move passenger car bodies around the plant

Remote control panel permits opening and closing of doors without the need for dismounting from the power truck

Efficient Elevators Boost Vertical Handling

Often neglected elevators can be the forgotten link in an efficient materials handling chain. Here one of the leading manufacturers tells how to avoid lost vertical motion

IT OFTEN happens that just when materials handling problems seem to be whipped, the even flow of traffic bogs down because of inefficient vertical transportation facilities. Many experienced men in the field don't even consider an elevator to be part of the handling system. That's probably because they take the inefficiency for granted and assume that not much can be done about it. They look at the elevator as it is and assume that's it: Otis Elevator Co. of New York, says that *isn't* it.

Here are some methods for speeding up your elevator traffic. Only one or two of them may apply in your case, but they're all worth knowing about. General idea is to equip your elevator with auxiliary equipment that will speed loading and unloading and enable it to carry capacity loads on each trip without waiting.

Roll It—Install roller conveyors permanently or temporarily on elevator car floor. Loads can be pushed on and off with a minimum of time and effort. Place roller conveyors in loading and unloading areas so loads can be accumulated and easily rolled into the elevator. Temporary accumulation storage near elevators reduces elevator waiting time.

Where a monorail conveyor system exists it can easily be tied in with the elevator by short sections of monorail attached to the car roof and connected by a switch to the main systems.

Put It on Wheels—Use trailers that can be towed to elevator by power truck and left for loading on elevators by other means while the truck is performing other jobs around the plant.

Build special wheeled dollies to carry standard subassemblies to and from elevator and throughout the plant.

Use bins, shelf trucks and other containers on wheels, rollers and casters to get capacity loads quickly and easily.

Factory-type, narrow-gage railroad tracks can be fastened to the elevator floor and connected with the main plant system by a switch so cars can be pushed into the elevator.

Install faster-opening, power-operated doors. Bi-parting doors open twice as fast as one-piece doors. Doors can safely start opening as the elevator approaches the landing so that load can be handled as soon as the elevator stops.

Here's Why—All of these ideas are aimed at cutting loading and unloading time. Material handling specialists have shown that an elevator is actually traveling only 25 to 30 per cent of the time. Loading and unloading actually consume 70 to 75 per cent of the elevator day. Thus the emphasis on this phase of operation.

Here are more thoughts:

Consider the use of gravity flow (chutes) for down travel of material.

Think about the use of small elevators or dumbwaiters for light, frequent loads.

Equip your elevator for self-leveling. It takes a good operator—or some time—to come within ⅜-inch of the floor on each stop yet this is automatic with self-leveling.

Open and close doors by remote control so that power-truck operator can operate doors without dismounting.

Just Off… to Help Y…

Free!

…IGHTS AND SAFE LOADS…

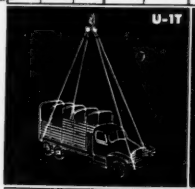
DIMENSIONS		WEIGHT IN POUNDS		FITTING SIZES	SAFE LOADS IN POUNDS			
	TUCK LENGTH INCHES	6 FOOT LENGTH	EACH ADDITIONAL FOOT	NONE	STRAIGHT PULL	BASKET HITCH		
	5	0.8	0.08		650	1,300	1,100	900	650
	6½	1.8	18		1,500	3,000	2,600	2,100	1,500
	8	3.0	30	SEE	2,600	5,200	4,500	3,600	2,600
	9½	4.8	.45	U-1-T TABLE	4,000	8,000	6,900	5,600	4,000
	11½	7.4	.70	BELOW	6,000	12,000	10,500	8,500	6,000
	14	10.0	.92		7,800	15,600	13,500	11,000	7,800
	15	13.2	1.2		10,000	20,000	17,300	14,100	10,000
	18	21.6	1.8		15,000	30,000	26,000	21,000	15,000
	24	35.0	2.7		22,000	44,000	38,000	31,000	22,000

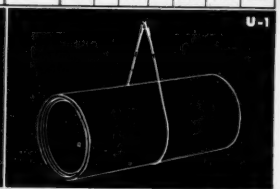
TYPE U

Eye Splices

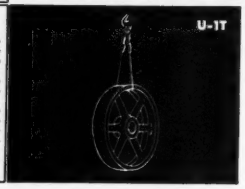
STANDARD EYE SIZES FOR U-1 TUFFY SLINGS

¼"	Tuffy Sling	4" eye
⅜"	Tuffy Sling	5" eye
½"	Tuffy Sling	6" eye
⅝"	Tuffy Sling	9" eye
¾"	Tuffy Sling	9" eye
⅞"	Tuffy Sling	12" eye
1"	Tuffy Sling	12" eye
1¼"	Tuffy Sling	15" eye
1½"	Tuffy Sling	18" eye





TYPE U-1-T



U-1T DIMENSIONS			WEIGHT IN POUNDS		FITTING SIZES	SAFE LOADS IN POUNDS			
CHAIN IN INCHES	MINIMUM LENGTH IN FEET	TUCK LENGTH INCHES	6' SLING, INCL FITTINGS	EACH ADDITIONAL FOOT	SLIP THRU THIMBLES TWO RECO Code No.	STRAIGHT PULL	BASKET HITCH		
½	5	8	6	0.30	UW-3	2,600	5,200	4,500	3,600	2,600
⅝	6	9½	9	0.45	UW-4	4,000	8,000	6,900	5,600	4,000
¾	6	11½	12	0.70	UW-4	6,000	12,000	10,500	8,500	6,000
⅞	8½	14	17	0.92	UW-5	7,800	15,600	13,500	11,000	7,800
1	8	15	20	1.2	UW-5	10,000	20,000	17,300	14,100	10,000
1¼	7	18	34	1.8	UW-6	15,000	30,000	26,000	21,000	15,000
1½	8½	24	51	2.7	UW-7	22,000	44,000	38,000	31,000	22,000

UNION WIRE ROPE CORP

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lpYou Cut Sling Costs!

Only Handbook of its Kind in the Sling Field. You just can't measure Tuffy Slings by the old sling standards. Because of the new characteristics and efficiencies developed in Tuffy's 9 part, machine braided wire fabric construction, all users of slings need this Sling Handbook to know the facts about lower sling costs through longer sling service. You can have it FREE for the asking. It gives you—

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You'll find this Sling Handbook and Riggers Manual easy to use and highly useful. A copy is yours with our compliments. Simply fill out and send the coupon.

Tie a knot in a Tuffy Sling. Note its flexibility. Pull the knot tight—then untie it. See how readily the patented braided fabric straightens out again.

It's hard to do by hand without the aid of a vise. If you are able to kink a Tuffy, then see how easily the patented braided wire fabric straightens out without material damage.

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To see how entirely different they are you just have to handle and try out a Tuffy Sling. That's why we have made up a supply of 3 ft. samples. Get yours and prove for yourself Tuffy Sling superiority. Fill out the coupon—It's FREE.

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Please send FREE of Cost—

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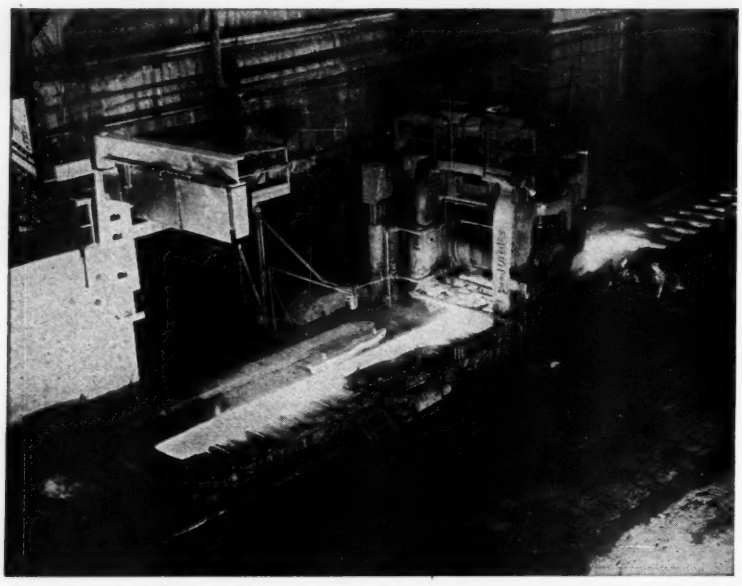
☐ 3 ft. Sample of Tuffy Sling

*Name*_____

*Title*_____ *Company*_____

*Address*_____

*City*_____ *State*_____



View of noncontacting width gage installed at last roughing stand in 80-inch hot mill, U.S. Steel Co.'s Irvin Works to maintain constant watch on strip

Strip Width Held to Close Limits

Noncontacting steel mill width gage measures deviations in width as small as 1/64-inch over a range of 10 to 96 inches increases tonnage of usable material

By GLENN R. PETERSEN
Special Products Section
General Electric Co.
Schenectady, N. Y.

SCRAPPING and rerolling off-size hot rolled strip costs the steel industry millions of dollars each year. Many of these profit dollars would be salvaged from the scrap barrel if strip thickness and width could be measured during rolling and any necessary adjustments made in mill settings. The widespread use of noncontacting x-ray thickness gages since their introduction in 1948 has done part of this measurement job. A further step has been taken with development of the new, noncontacting steel mill width gage.

Gage is shown mounted 15 feet above the mill bed on the 80-inch hot strip mill at the Irvin Works of the United States Steel Co. High up and out of the way of mill operations, it measures deviations in width as small as $\frac{1}{64}$-inch over a range of 10 to 96 inches. Schematic diagram shows the detector head containing the two scanning heads on which are imaged the bright edges of the steel strip. These units, using the light radiated from the hot strip, generate the measuring signals which compare the strip width with the gage settings. Variations in width are then shown on a deviation indicator.

Acid Tested—The gage at Irvin is installed at the last roughing stand, where it measures the width of all strip before it enters the finishing end of the mill. It has been in operation for about six months and has proved its accuracy and dependability and also passed the hardest test of all—acceptance by the men who operate it.

As in most mills, previous practice was to hand measure occasional strips with a "yard stick" as a check on mill settings. When the gage was first installed, the operators checked its readings very carefully using the yard stick as their reference. As their confidence in the gage grew, it gradually became the reference and finally, when differences between the two readings were noted, it was the reading of the yard stick that was questioned. Recently, when an operator found the gage showing strip width to be 1-inch wider than he thought it should be, he checked, found the gage to be right, and was able to correct the mill settings before any more strip was rolled.

More Data — Early checks on width showed some strip to be diamond shaped, that is, wider in the center than at the ends. This was apparently caused by the position of the slab in the squeezer and was corrected by making adjustments there. The interesting point is that this condition was found because the gage measured the width of the strip over its entire length rather than at only a few points as in the old method. For the first time it is now possible to know the contour of each strip without stopping the mill to make the measurements and to have the information early enough to correct for any errors on all slabs after the first.

Actually these are minor benefits, for the real advantages of the gage will come from increased tonnage of usable strip. Today, if the finished product is to be 36-inch strip it may be necessary to roll the strip 36½ or 37 inches wide to allow for variations in the rolling process. When the steel is later side trimmed, ½ to 1-inch of good steel becomes scrap at a substantial reduction in value. With the width gage this over-width

Banish the "Bite"

ON PICKLING AND PLATING EQUIPMENT

with these NATIONAL (TRADE-MARK) CARBON AND GRAPHITE AND KARBATE (BRAND) IMPERVIOUS GRAPHITE PRODUCTS

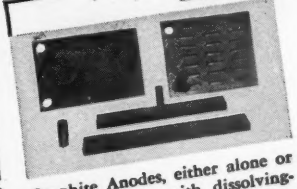
Pickling and tinning are messy, expensive — and *necessary*. However, you can *greatly reduce* equipment maintenance costs and improve plant housekeeping by making full use of these National Carbon products wherever service is dirty and tough. As is well known by manufacturers of your pickling and plating *solutions*, only carbon and graphite and impervious graphite withstand the "bite" of so wide a range of corrosive chemicals.

HERE'S WHERE THEY'RE USED:

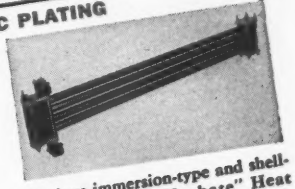
STAINLESS PICKLING

Carbon brick tank linings with "Karbate" Plate-Type Heat Exchangers and drain lines offer powerful resistance to nitric-hydrofluoric solutions.

ELECTROLYTIC PLATING

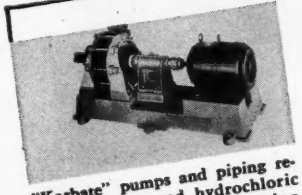


Graphite Anodes, either alone or in combination with dissolving-type anodes, are non-contaminating and long lasting.



Various immersion-type and shell-and-tube type "Karbate" Heat Exchangers are available to suit capacity requirements.

CARBON STEEL PICKLING



"Karbate" pumps and piping resist sulphuric and hydrochloric acid attack . . . protect solution from contamination.

"Karbate" Shell-and-Tube Heat Exchangers are often most economical where more than 50 square feet of heat transfer surface is required.

Graphite Tank Rolls provide an ideal combination of good electrical conductivity and resistance to acid attack in electrolytic pickling operations.

The terms "Karbate" and "National" are registered trade-marks of Union Carbide and Carbon Corporation

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OTHER NATIONAL CARBON PRODUCTS

BLAST FURNACE LININGS • BRICK • CINDER NOTCH LINERS • CINDER NOTCH PLUGS • SKIMMER BLOCKS • SPLASH PLATES • RUNOUT TROUGH LINERS • MOLD PLUGS • TANK HEATERS

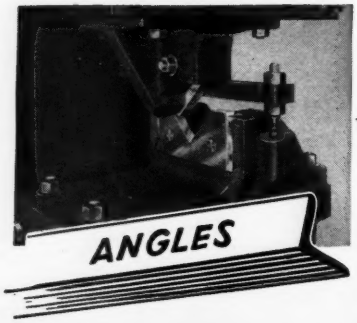
THE TREND IS TO THOMAS

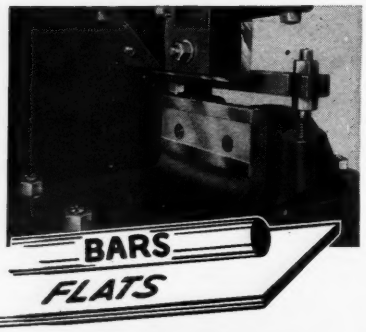
Heavy BAR and SHAPE SHEARS

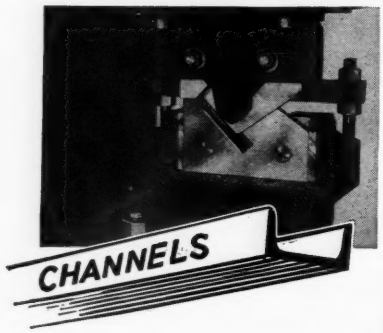
... with interchangeable tools

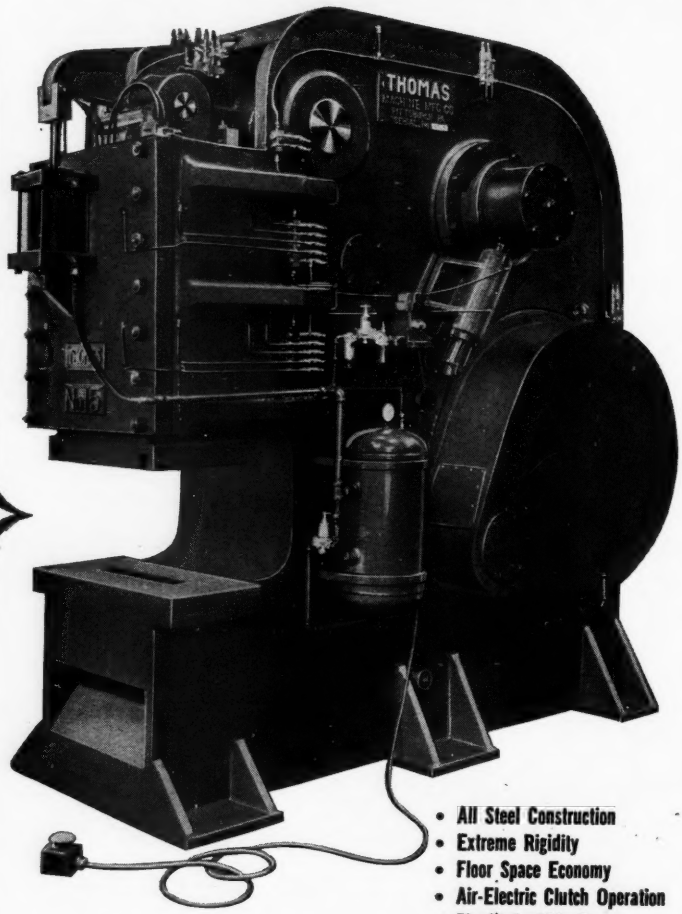
Another example of how Thomas specialization

CUTS SHEARING COSTS









- All Steel Construction
- Extreme Rigidity
- Floor Space Economy
- Air-Electric Clutch Operation
- Flywheel within Frame on Anti-Friction Bearings

Production supervisors will particularly appreciate the quick tool change features, since this results in minimum "down time" when short runs of different shapes are scheduled.

A size to meet your need—50 to 300 tons

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

33

allowance can be reduced and the tons of scrap converted into tons of extra length.

Big Loss Avoided—Occasionally, too, the strip may be too narrow, and before the error is caught at the coilers a number of coils are rolled which have to be reclassified, again at extra expense. The width gage, located at the roughing end of the mill, will catch such errors on the first strip—soon enough to correct them.

It is still too early to determine the direct savings in weight of steel which will result from use of the gage, but everyone connected with the project is very confident. The growing pains accompanying any new product are now over, and, as operating experience increases, the gage can really be put to work. In another few months the savings which are now considered probable should become a reality.

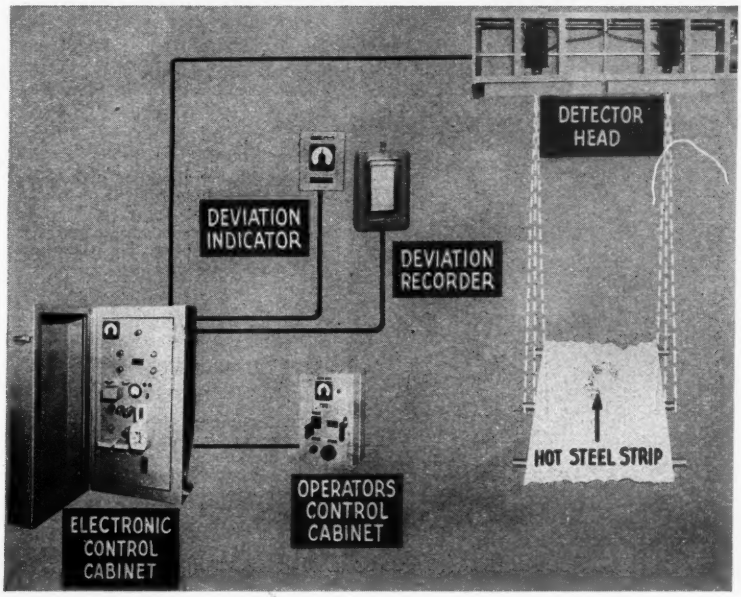
Other Chapters—This is not the complete story of the gage, however, for several mills are now planning installations of the gage at a second location, the last stand of the finishing mill. Here, a recorder will make a permanent record of the width of each coil rolled and provide valuable information for cold mill as well as hot mill operators.

With the gage mounted between the last two stands of the hot mill, any necking down of the steel because of tension will be noted and roll speeds can be adjusted. Used in conjunction with the x-ray gage, the width gage will provide valuable information on the effect of tension on both strip width and thickness. And, should two width gages be used, operators could determine what changes in width occurred in the finishing mill.

On the Nose—Value of the gage to cold mill operators may be as great or greater. Practices vary, but in many mills no side trimming is done unless the strip width varies so greatly as to endanger cold mill operations. This allowable variation may be as much as ½-inch. Until now, no sure method of determining this variation existed. The width gage, mounted on the hot mill, will take the guesswork out of this problem. For those mills where side trimming is the general practice, the tonnage lost in trimming should be reduced, since the width throughout the coil will be known.

While many benefits from use of the gage are foreseen, most striking are the expected savings in over-width tonnage as calculated by our engineers. If a mill rolling 100,000 tons of steel per month at an average width of 36 inches could reduce this average by ¼-inch, 700 tons of steel would be converted into useful length. Assuming $15 per ton as the increased value of this extra length, the savings would be $10,500 per month or $126,000 per year. If savings like these are realized, the width gage is assured of a place alongside other essential production tools that are used in the steel industry.

Diagramatic view showing component parts of the new steel mill width gage



Die Stock Hardens in Air

New type of precision ground die and flat stock made to a special analysis for hardening in air is announced by L. S. Starrett Co., Athol, Mass. A 5 per cent chromium content makes the stock especially wear ressistant.

The firm recommends applications for punches and dies used in long production runs or for stamping silicon, stainless steel, Monel and other abrasive materials. They report an average of 50 per cent more pieces per sharpening can be expected than with oil hardening steel.

Plant Layout Model Patented

A plant layout method using three-dimensional models as a planning medium is now covered by U. S. and Canadian patents granted to H. H. Dasey, Oakmont, Pa., president of Visual Planning Equipment Co. Inc. The models are coupled with a photo film two-dimensional templet.

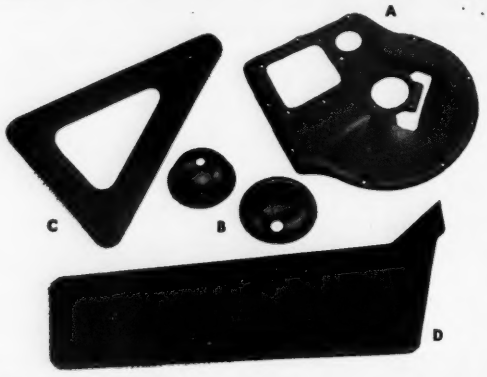
The film templet, used with a film grid sheet, makes it possible to secure ozalid or blueprints directly from the three-dimensional layout. Layout and lettering time is eliminated and prints standardized.

Molder Produces Deep Parts

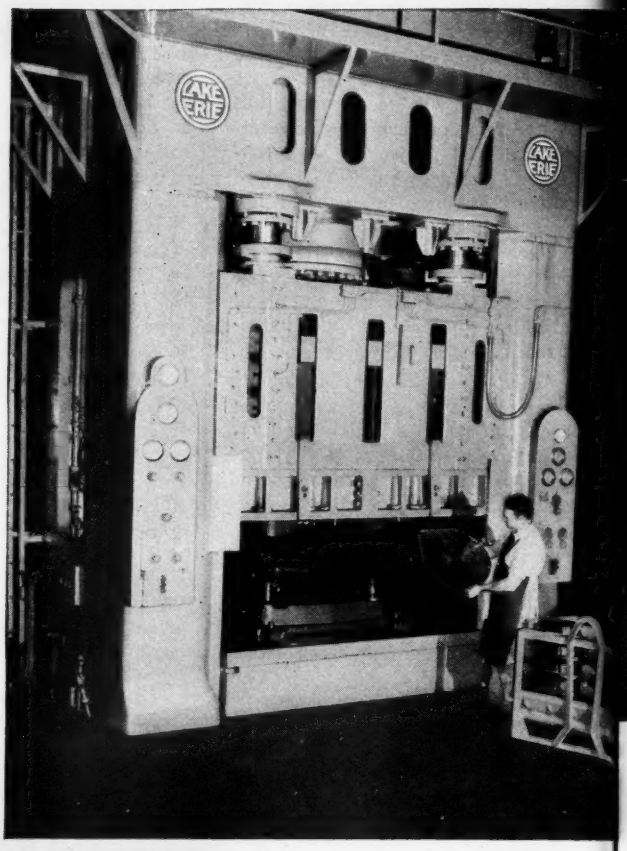
Exceptionally deep parts are produced by a new preplasticizing injection molding machine reported by Hydraulic Press Mfg. Co., Mt. Gilead, O. The model plasticizes molding powder before it contacts the injection plunger. The plasticizer has a 48-ounce shot capacity, high injection speed, mold clamp capacity of 400 tons and mold clamping stroke measuring 30 inches.

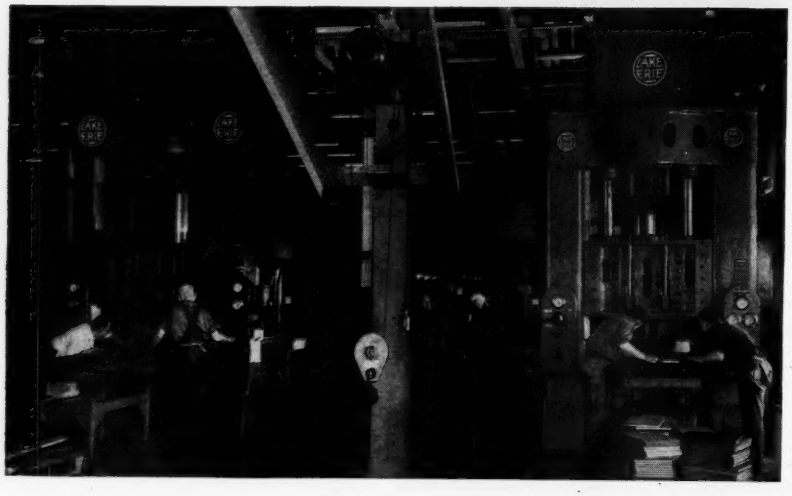
CATERPILLAR TRACTOR CO.
demonstrates the **wide applications**
of Lake Erie Hydraulic Presses

A good example of the great variety of money-saving opportunities for hydraulic presses in the modern metal working plant.



TYPICAL PIECES FORMED ON PRESSES. (A) Steel cover 35″ long, 26″ wide and 1/32″ thick is blanked and drawn in a single operation with 1200 tons pressure. Cover is pierced, trimmed and restruck on smaller hydraulic press after blanking and drawing. (B) King bolt liners formed out of .134″ hard brass are 8″ in diameter. Pieces are blanked, drawn and coined on the 500 ton Lake Erie press. (C) Earth-moving bulldozer lifting crank 24″x24″x12″ outside, 12″x12″x10″ inside x 1″ thick blanked in a single operation. (D) Blank for earth-moving bulldozer end plate is 10″ wide at one end, 12″ at other, 54″ long and 3/8″ thick.



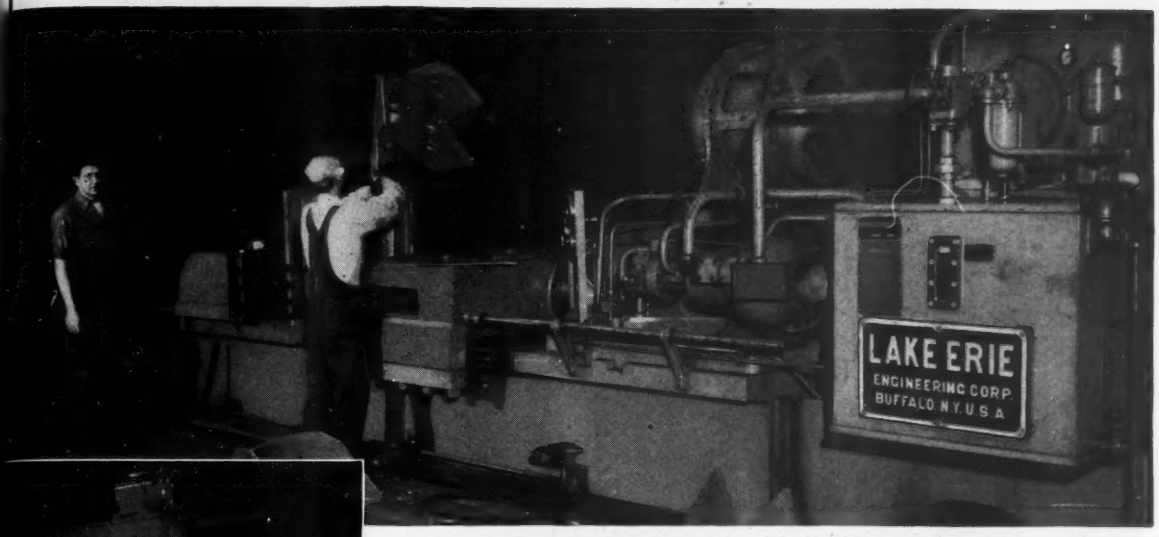


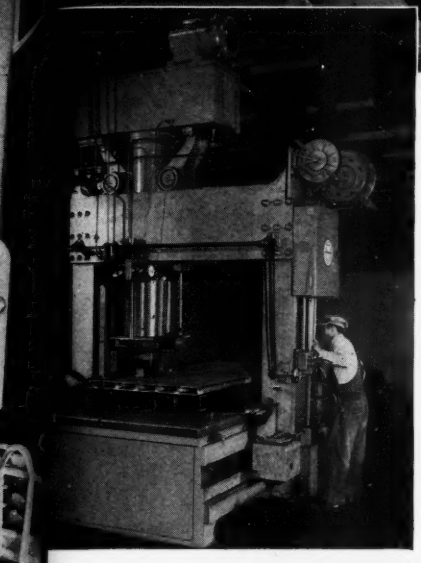
2000 TON DOUBLE ACTION PRESS.

This press has a 500 ton hydro-pneumatic die cushion, bed size of 96″x96″ and daylight opening of 60″. It is used generally for forming large pieces requiring high tonnage, but is also used for heavy blanking jobs.

750 TON SINGLE ACTION PRESS *left* —500 TON DOUBLE ACTION *right*.

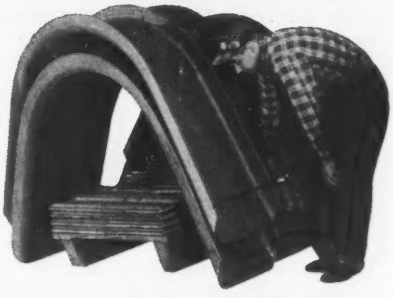
These presses are used for a wide variety of forming operations including blanking, bending, drawing, piercing and coining. The pieces illustrated at left above are a few examples of the work done on the three presses shown on this page.

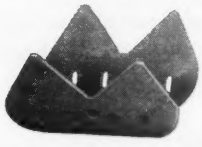




500 TON HYDRAULIC BULLDOZER.
This widely-used horizontal press is shown hot forming draft frame reinforcements. Pieces are ⅜" thick, 30" wide and approximately 4' long before bending. A pressure of 400 tons is used.

200 TON TRAVELLING HEAD STRAIGHTENING PRESS.
A versatile, highly accurate press that is very much in demand. Used to straighten all types of weldments such as bulldozer blades and other large weldments, some of which appear in lower right corner of photo.





● The piece shown above is another example of hydraulic bulldozer work. It illustrates draft frame bottom plates which are hot formed from ⅜" thick stock 7½' long before bending. Draft frame reinforcement also formed on hydraulic bulldozer is shown at left.

THE ABILITY OF LAKE ERIE HYDRAULIC PRESSES to perform a multitude of production jobs that save time and money, simplify design and assembly, and result in a better product for the manufacturer is amply demonstated at Caterpillar Tractor Co. A carefully selected group of Lake Erie hydraulic presses is busy doing a wide variety of metal forming work. This includes hot and cold bending, drawing, straightening, blanking, piercing, coining, and many other operations, a few of which are illustrated on these pages.

It is hard to conceive of a metalworking plant today that wouldn't benefit immensely through the use of one or more of these hydraulic presses—possibly a hydraulic bulldozer... or a straightening press... or a single action press with die cushion... or some other type or combination of presses. Why not discuss this possibility with our engineers? We have developed more than 3,500 designs for hydraulic presses to meet practically all needs. We serve the leaders throughout industry with complete satisfaction. We can do it for you. Write or phone today.

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LAKE ERIE HYDRAULIC PRESSES are available in any size... standard, modified and special designs—horizontal and vertical types—for Metal Working—Plastics Molding—Forging—Metal Extrusion—Processing—Vulcanizing—Laminating—Stereotype Molding—Die Casting—Briquetting—Baling—Special Purpose. LAKE ERIE ®

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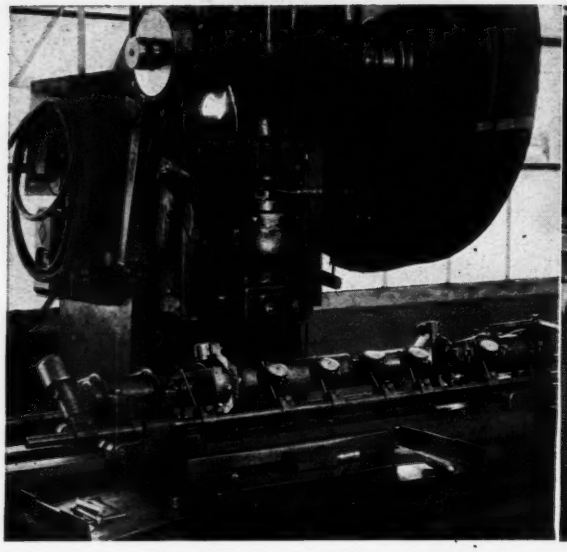
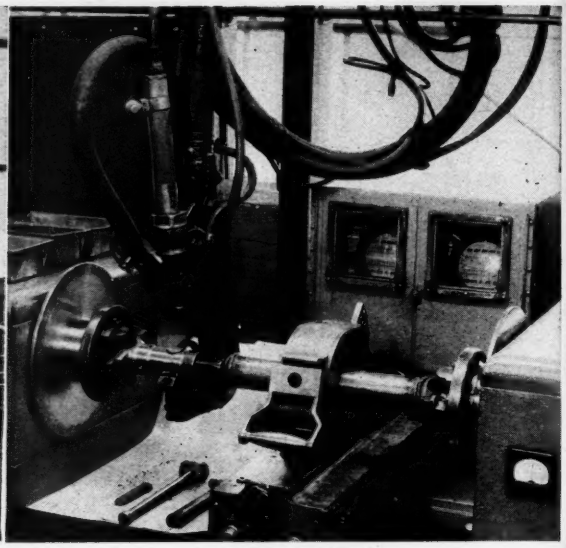


Sliding fixture setup on press bed used to straighten propeller shaft assemblies. Indicators are rocked into position to check the runout



After shaft assemblies are checked for unbalance, gun welder is used to spot weld blank of correct weight to hub to correct unbalance

Fast Shaft Balancing:

TRUING ALMOST ON THE NOSE

Oscillographs that provide quick visual indications speed spotting of unbalance locations. The shafts are checked within ½ to 1 inch-ounce of the true balance

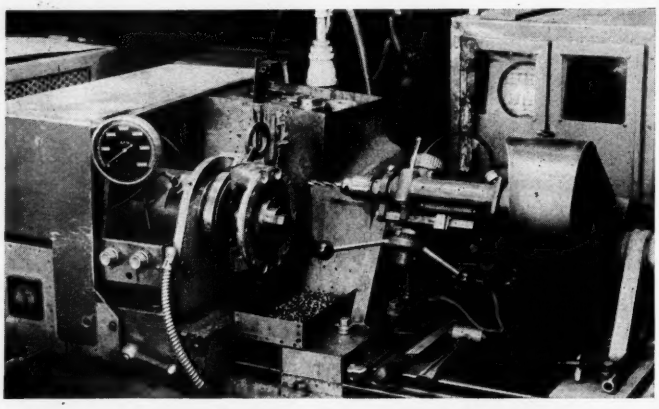
By HERBERT CHASE

BALANCING propeller shafts for autos, trucks and other applications at Mechanics Universal Joint Division, Borg-Warner Corp., Rockford, Ill., is a fast operation. Dynamic machines used not only do the job quickly but also check the units within close limits—bringing them to within ½ to 1 inch-ounce of true balance if necessary.

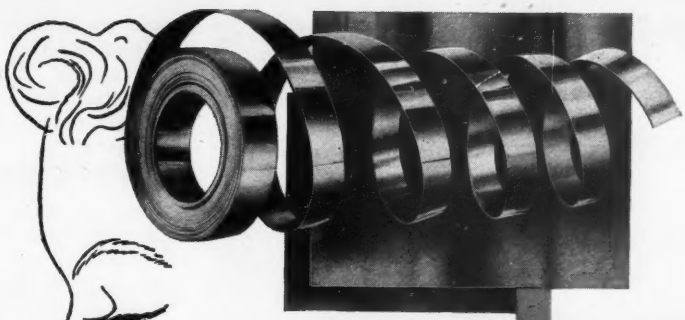
Here, both amount and angular location of the unbalance are determined by General Motors dynamic balancing machines, each of which is equipped with oscillograph instruments to provide the visual indication of the degree of unbalance, and where steel must be added or machined away to bring the components into balance.

Props Checked First—Before assemblies are balanced, however, shafts are checked for straightness and, if necessary, are straightened in a setup like that shown in an accompanying photo. This includes a slidable fixture on the bed of a crank press which does the straightening. On the fixture, are five indicators that bear at various points along the shaft, which is mounted in a speed chuck at one end and on a center at the opposite end, both being on spring supports.

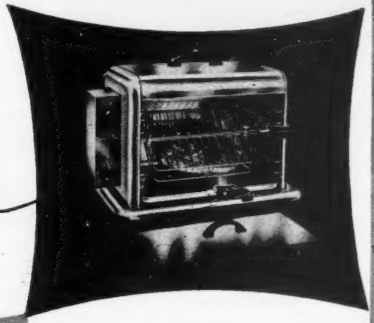
Indicators that bear on the hol-



Here, a single head of a balancer is used to check a yoke flange. Unbalance is corrected by drilling holes in heavy side of the flange

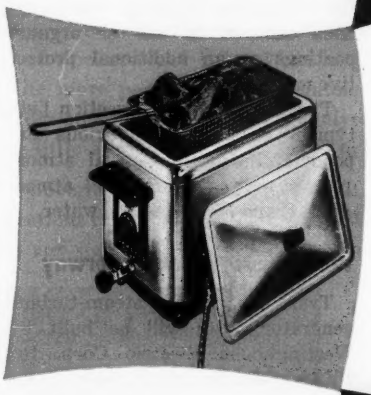


PRODUCT BEAUTY MORE THAN SKIN DEEP



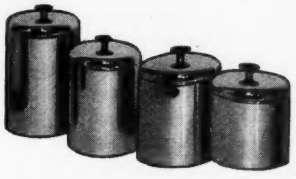
Takes the STING from production time

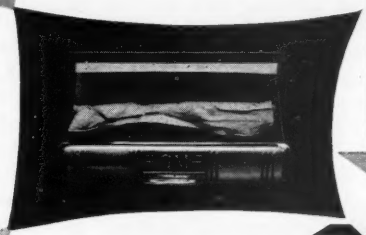
Puts ZING into your entire line!

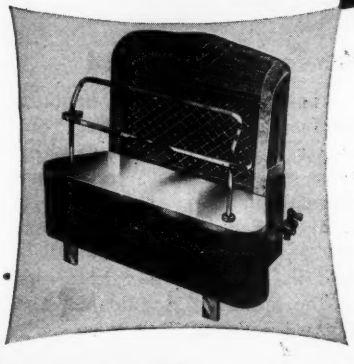


LEARN MORE about Nickeloid Metals at the Metals Congress in Philadelphia Convention Hall, October 20 to 24. We'll be there with samples of our metals and with typical successful applications in modern product design. See us . . . get more information about Nickeloid Metals . . . in Booth No. 1378.

The beauty of the American Nickeloid metal-finished products goes *way* down deep. Past the lustrous finish of the Pre-Plated Metals . . . all the way back to the production line! Here Nickeloid Metal parts are simply (1) *Fabricated*, then (2) *Assembled.* No cleaning, plating or polishing needed because Nickeloid Metals are furnished in sheets, strips, or coils — all ready for window display! As you look at these eye-catchers, remember that the reduced manufacturing cost looked beautiful on the profit ledger, too!







NICKELOID METALS (Pre-Plated)

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Electro-plated TO ALL COMMON Base METALS
ALSO LACQUERED COLORS
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OLDEST AND LARGEST PRODUCERS OF PRE-PLATED METALS

AMERICAN NICKELOID COMPANY

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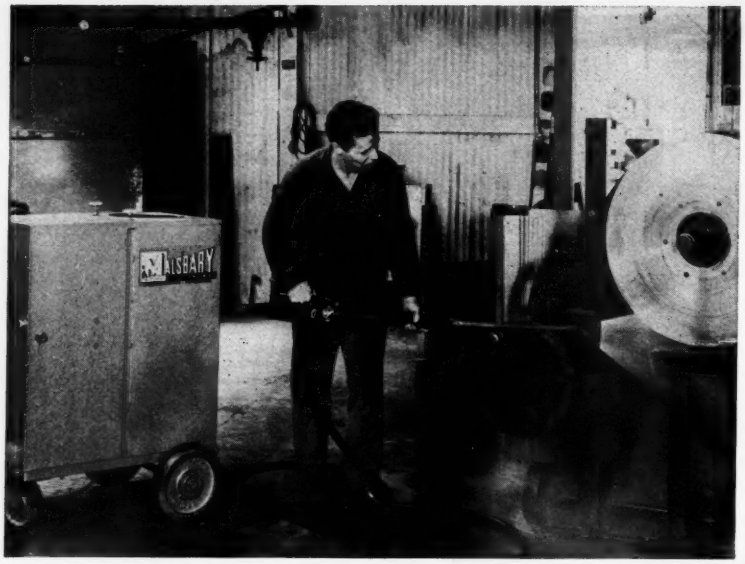


Steam—But Not Necessarily Fire

Fireless steam cleaner made by Malsbary Mfg. Co., Oakland, Calif., gets its heat and pressure from steam lines used for regular production and heating purposes. At full capacity, it delivers 200 gallons of solution per hour at temperatures to 212°F and pressures to 90 psi. The variable-volume pump enables the operator to maintain a solution balanced to available steam volume

low shaft itself, which is not machined on its outside diameter, must not show more than 0.015-inch total indicator reading and others, which bear on machined surfaces, must not show more than 0.005-inch runout.

After the indicators are read, they are rocked back to clear. The fixture is slid to correct position for straightening and supports are placed where needed to straighten. A hand tool that has a radius to fit the shaft is then placed below the ram and the press is tripped to affect straightening. If necessary, this process is repeated until all indicators read within the limits specified.

The Balancing — Balancing of universal shaft assemblies is done with each assembly set between the heads of the machine. A safety gate guard at the center is closed but does not bear on the shaft. Then, the machine is started and turns the shaft at 3000 rpm while the instruments showing the amount and location of unbalance are read.

When this is done, the machine is stopped and a weight to correct the unbalance is spot welded at the required point, using a gun welder that is suspended above the machine for this purpose. A check run is then made to be sure that the weight does bring the balance within specified limits. About 20 to 25 assemblies per hour of the size shown are commonly balanced in this machine.

Machine Checked Frequently — Other assemblies require more or less time, depending on size and ease of handling into and out of the machine. The machine itself is checked every two to three hours by applying a 7-gram weight at a check hole in the flange, and reading the instruments when the flange is rotated.

In another similar machine, but using only one head, yoke flanges or other components produced in this plant are checked for dynamic balance, independent of assemblies.

After the unit is centered on the head flange and is fastened, it is checked for unbalance by the indicator reading. In this case, however, metal is removed from the heavy side rather than being added on the light side.

A light drill, set on the bed of the machine is used to remove metal—being fed into, but not through the flange. One or more shallow holes are drilled on the heavy side, depending upon the size of drill and amount of unbalance to be corrected. Balance with ½-inch-ounce is readily attained.

Metallizing Standard Published

One of the newer means offering protection against corrosive atmospheres and sea water is application of a thin layer of zinc or aluminum by metallizing. How these metals are best applied and how much of which metal to use for different conditions is the subject of the latest American Welding Society standard, "Recommended Practices for Metallizing: Part IB—Application of Zinc and Aluminum for Protection of Iron and Steel."

Covered in detail in a descriptive booklet published by the society are materials and equipment to be used; blasting and spraying techniques; inspection procedures for verifying coating adequacy. Also covered is use of organic coatings as an additional protective measure.

The standard's final section lists typical coatings for various exposures, including general atmospheres, salt and industrial atmospheres, and fresh and sea water.

TVA Generator Job Underway

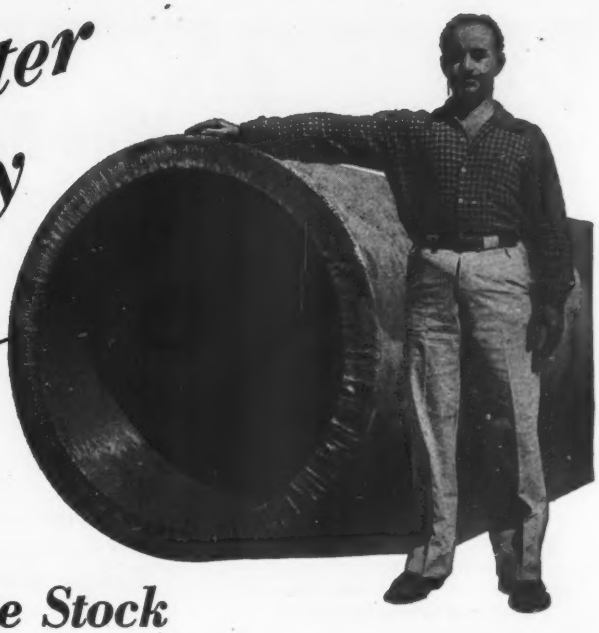
Two 250,000-kw steam-turbine generator units will be built by Westinghouse Electric Corp. for TVA's Gallatin plant near Nashville, Tenn. The company reports they will be the largest single-shaft machines ever built.

The 36,000-rpm triple-exhaust turbine will be designed for steam at an initial pressure of 2000 psi, and at 1050° F with reheat to 1050. Generator rotor and stator will be inner-cooled.

Handling Talks Scheduled

Application and design slants on advanced material handling techniques will occupy two days for those attending the Westinghouse biennial handling conference in Buffalo. Scheduled October 28 and 29, the first day's sessions will be held at Statler Hotel, the second at the sponsor's Buffalo Motor & Control Division.

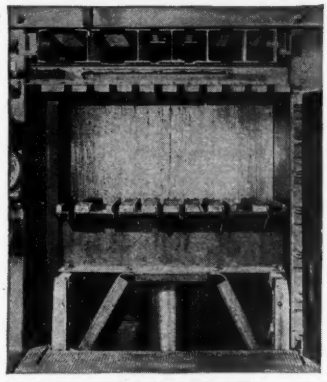
Now! Large diameter centrifugally cast tubing



Available from FRASSE Warehouse Stock

ACIPCO steel tubing, centrifugally cast, is now available from Frasse in sizes ranging from 2″ to 50″ O. D., wall thicknesses of ¼″ to 4″, in lengths up to 16 feet. The more popular sizes are immediately available from stock. Other sizes and analyses (in quantities as little as 16 feet) can be made to order promptly.

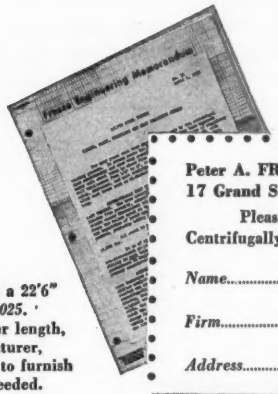
Government, ASTM, AMS, ABS, ACI and AISI specifications can be readily met. ACIPCO tubing is made in any standard or non-standard analysis. Steel used in its manufacture is produced in electric furnaces.



Fabrication of this hydraulic baling press required a 22′6″ ram of AISI *1030*, and a 21′6″ cylinder of AISI *1025*. ACIPCO tubing, circumferentially welded to proper length, was used successfully for both items. The manufacturer, Consolidated Baling Machine Co., relied on Frasse to furnish ACIPCO tubing in the size, length and analysis needed.

Typical applications for ACIPCO tubing include: Hydraulic cylinders, ship propulsion shafts, cracking still tubes, retorts, and paper mill rolls. In addition, it has received wide recognition as a component in weldment applications. Why not investigate the many advantages offered by this versatile product?

Frasse Engineering Memorandum #11 covers in detail the characteristics, properties, analyses and pertinent facts about ACIPCO centrifugally cast steel tubing. Mail the coupon below for your free copy today.



COMPLETE FACTS ABOUT ACIPCO CENTRIFUGALLY CAST TUBING

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Please send me, without obligation, complete facts about ACIPCO Centrifugally Cast Steel Tubing.

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Firm.....

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Call FRASSE 1st for **SEAMLESS, WELDED AND CENTRIFUGALLY CAST STEEL TUBING**

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Four wires per strand are presented to sheave groove for wear

Wire Rope Life Increased On Hot Metal Cranes

By WALTER C. RICHARDS
Chief Engineer
A. Leschen & Sons Rope Co.
St. Louis

Flattened strand construction of cable permits the use of 10 per cent more metal than round strand wire rope thus affording greater strength and safety. Keystone shape of strands and small core offers greater resistance to crushing

WIRE cables that rig the hot metal cranes in steel plants must be exceptionally rugged. They are exposed to the intense heat of molten steel and at the same time are responsible for the safety of a highly valuable and potentially dangerous load. These cables are probably the most expensive ones in a steel plant, so the length of time they can be kept in service is important both from the standpoint of safety and economy.

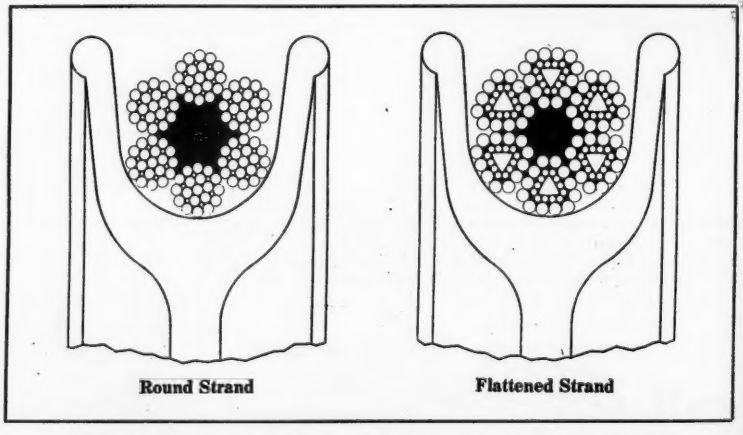
In many steelmaking shops the opinion had been prevalent that a life of one year was about all that could be expected from the ropes on ladle cranes. This was based on the use of 6 x 19 and 6 x 37 round strand rope with either fiber or independent wire rope core. Accurate service records of a number of leading steel plants, however, have proven the outstanding performance of flattened strand wire rope on this important and difficult application.

Handled Large Tonnage — One large midwestern plant has used it exclusively since 1945. The first rope was carefully inspected throughout its life and especially after it had passed its second anniversary. At the end of four full years it still looked good, but was replaced on general principles. After handling more than 1,800,000 tons of steel, exclusive of the weight of ladle, hooks, etc., in over 12,000 heats, it was found that wear had been only 3/64-inch and that the breaking strength was still higher than the original rating.

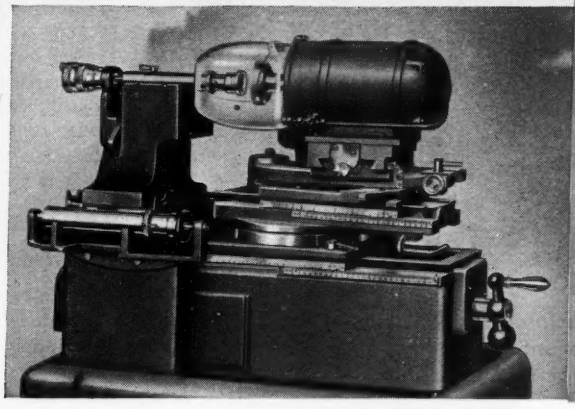
Another plant reported that it increased wire rope service on hot ladle cranes by two to three times with the use of flattened strand wire rope; others have had similar experiences.

The main attribute of this type of wire rope is its ability to give longer life under the more severe conditions of abrasive wear, where round strand ropes have been discarded simply because the cross-sectional area has been reduced beyond the safety point. Once outer wires have lost about 35 per cent of their diameter through wear and corrosion, they become more readily displaced and subsequently broken as a result of reverse bending and general punishment. In round strand rope the crown wire of each strand receives the greatest wear since at first it alone can touch the sheaves. By the time the adjacent wires can assume a part of the wear the crown wire may already be dangerously worn.

Each of the strands in flattened strand rope is keystone-shaped in cross section, as shown in the accompanying illustrations. This makes possible a number of important results. First, it presents



Comparison of rope patterns as they appear in sheave groove



REMOVING BURS (above) from brass lens-coating plate. The right file for use on this ductile metal is the Nicholson Brass File (illustrated). Its short upcut angle prevents file from running off the work. Its long overcut produces many tooth points on the upcut to break up filings; also allows file to clear itself of chips.

LATHE FILING (upper left) cast-iron housing part of Micro-Surfacer. The right file for smoothing work spun on a lathe is the Nicholson Long Angle Lathe File (illustrated). Long angle of its single-cut teeth slides chips down and out, minimizing chances of filling up and of scratching metal being filed.

American Optical SPEEDS PRODUCTION

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In the American Optical Company's recently developed Universal Micro-Surfacer (*illustrated*), startling new heights of accuracy and speed are attainable in the production of prescription optical lenses.

Properly shaped, accurately cut, uniformly hardened Regular and Special Purpose files are necessary for many of the hand finishing and fitting operations involved in its construction and that of other American Optical products. The Nicholson policy of *Twelve perfect files in every dozen* was undoubtedly an important factor in the selection of file brands. The files you see pictured in action are NICHOLSON.

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four wires per strand to the sheave groove for wear instead of one. This permits longer and more even wear. Second, the strands rest snugly against each other into a pattern that better resists crushing. There is less chance for the strands to cut each other, and less internal friction. Third, the compact pattern of strands permits a smaller core. Flattened strand, therefore, contains about 10 per cent more metal and is consequently 10 per cent stronger and safer than round strand wire rope of the same diameter. Fourth, the relatively smooth circumference prevents corrugating of the sheave groove.

The range of sizes used on hot metal cranes is from ⅞-inch to 1¼ inches. Larger and smaller sizes of flattened strand wire rope are also used for skip hoists on blast furnaces, and for other similar duties.

Mobile Petroleum Tanks Tested

Newly designed mobile petroleum tank intended as an auxiliary source of bulk petroleum supply by land or air is undergoing field testing by the Army Quartermaster Corps.

Two experimental models of the 800-gallon fuel tank were constructed for the corps by the Martin Parry Corp., Toledo, O. Drawn in tandem behind an Army truck, they were exhibited in Washington before being taken to the field for tests. Tanks will be towed at high speeds over rough roads and terrain, loaded and unloaded in cargo aircraft and studied for general usefulness.

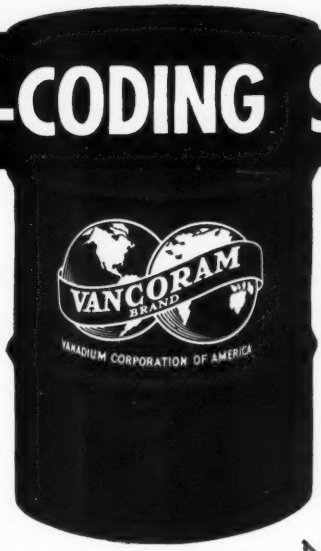
Short-Cycle Test Control

A short-cycle time-proportioning relay has been developed for controlling metallurgical and laboratory-size furnace testing. Applications for the new model will be made in metallurgical testing where high speed furnaces are used and for laboratory-size furnaces having small capacities and short time lags.

Manufacturer, Minneapolis-Honeywell Regulator Co., Philadelphia, will add the model to the Electr-O-Pulse relay line produced by its Industrial Division.

VANADIUM'S new system of

COLOR-CODING SHIPMENTS



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Now . . . turn the page to see how this system works

VANADIUM'S new color-coding system gives faster handling, quicker identification

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A different color is assigned to each major alloying element. The color identifying each major element and the name of the product appear on every label.

MAJOR PRODUCTS ARE IDENTIFIED BY THE FOLLOWING COLORS:

PRODUCT	COLOR	PRODUCT	COLOR
Aluminum	Silver	Ferro Vanadium	Light Blue
Ferro Chromium	Yellow	Grainal	Dark Blue
Ferro Silicon	Red	Noduloy	Green
Ferro Titanium	Orange		

Multiple-element products are identified by combinations of colors. High carbon products are further identified by black squares on top band of the label, and low carbon products are identified by white squares on the top band of the label.

These product-identifying colors are used on drum labels; on car cards for carload shipments; and on tags attached to products shipped in bags.

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CALENDAR
OF MEETINGS

September 29-October 2, American Institute of Steel Construction Inc.: Annual convention, Empress Hotel, Victoria, B. C. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

September 30-October 3, Association of Iron & Steel Engineers: Fall meeting and exhibit, Hotel Statler and Public Auditorium, Cleveland. Association address: 1010 Empire Bldg., Pittsburgh 22. Director: T. J. Ess.

OCTOBER

October 3-4, American Institute of Mining & Metallurgical Engineers, National Open Hearth Steel Committee: Fall meeting, Southern Ohio Section, Deshler-Wallick Hotel, Columbus, O.

October 3-5, Society of Industrial Designers: Annual meeting, Shawnee Inn, Shawnee-on-Delaware, Pa. Society address: 48 E. 49th St., New York 17. Secretary: Sally G. Swing.

October 6-7, Rail Steel Bar Association: Fall meeting, Hotel Cleveland, Cleveland. Association address: 38 S. Dearborn St., Chicago. Secretary: W. H. Jacobs.

October 6-10, National Hardware Show: Grand Central Palace, Atlantic City, N. J. Managing director: Frank Yeager.

October 9, American Iron & Steel Institute: Regional technical meeting, William Penn Hotel, Pittsburgh. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

October 10, National Noise Abatement Symposium: Armour Research Foundation, Illinois Institute of Technology, sponsor, Technology Center, Chicago.

October 11-14, National Association of Waste Material Dealers Inc.: Fall meeting, Los Angeles. Association address: 271 Madison Ave., New York. Secretary: Clinton M. White.

October 13-17, American Institute of Electrical Engineers: Fall general meeting, New Orleans, La. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 14-16, Society of Industrial Packaging & Materials Handling Engineers: Annual meeting and short course, Chicago Coliseum, Chicago.

October 16-17, Gray Iron Founders' Society Inc.: Annual meeting, Hotel Cleveland, Cleveland. Society address: 210 National City-E. 6th St. Bldg., Cleveland. Secretary: Donald H. Workman.

October 16-18, Foundry Equipment Manufacturers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: Engineers Bldg., Cleveland 14. Secretary: Arthur J. Tuscany.

October 17, American Supply & Machinery Manufacturers Association and National Industrial Distributors Association: Joint regional meeting, Benjamin Franklin Hotel, Philadelphia. ASMMA address: 814 Clark Bldg., Pittsburgh. General manager: R. Kennedy Hanson.

October 17-19, Metal Treating Institute: Annual meeting, Hotel Warwick, Philadelphia. Institute address: 271 North Ave., New Rochelle, N. Y.

October 18-19, American Society for Metals: Annual seminar, Benjamin Franklin Hotel, Philadelphia. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

October 19-21, Conveyor Equipment Manufacturers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: No. 1 Thomas Circle, Washington 5. Executive vice president: R. C. Sollenberger.

October 19-22, American Institute of Wholesale Plumbing & Heating Associations Inc.: National convention, Chalfonte-Haddon Hall, Atlantic City, N. J. Institute address: 402 Albee Bldg., Washington, D. C. Executive secretary: George T. Underwood.

October 20-22, Packaging Institute: Annual meeting, Hotel Commodore, New York. In-

(*Continued on p. 112*)

THIS DOG HAS HAD HIS DAY!

There's a nostalgia associated with the clang of the "fire pumper's" bell, the clatter of the horses' hoofs and the sharp bark of the Dalmatian as the fire-fighters of yesteryear answered their calls.

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Those rolled steel flanges you buy for installation on your pressure vessels, on fabricated, flanged piping fittings, and for other uses have a vital bearing on the performance and reliability of the equipment. It's just plain good business to insist on the top-notch quality that will safeguard the reputation of your products!

Providing this high quality is an every-day production aim at Standard Steel Works Division. The flanges start with steel produced in Standard's own open-hearth furnaces—which permits continuous metallurgical control. Forging is done on special machines, by men who have made a career of making fine flanges. Modern heat treating facilities assure stress-free blanks, and develop all desirable properties inherent in the metal. Adequate machine tools expedite turning.

Advantages extend even further. A simple, convenient form, "Dimension Blank for Rolled Steel Flanges" greatly simplifies the job of obtaining quotations. The form can be filled out in a few moments with all the data needed to obtain a price. We will be glad to send you some copies of this form, if you will write.

Standard is big enough to handle almost any job—small enough to make each job a matter of individual concern. We would like to serve you.

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(Continued from p. 109)

stitute address: 342 Madison Ave., New York 17. Secretary: L. V. Burton.

October 20-24, American Society for Metals: Annual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 7301 Euclid Ave., Cleveland 3. Secretary: W. H. Eisenman.

October 20-24, American Welding Society: Annual meeting, Bellevue Stratford Hotel, Philadelphia. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 20-24, Society for Non-Destructive Testing Inc.: Annual meeting, Hotel Sylvania, Philadelphia. Society address: Box 710, Evanston, Ill. Secretary: Philip B. Johnson.

October 20-24, American Institute of Mining & Metallurgical Engineers: Fall technical session, Philadelphia. Institute address: 29 W. 39th St., New York 18. Secretary: Edward H. Robie.

October 20-24, National Metal Congress & Exposition: Convention Hall, Philadelphia. Secretary: W. H. Eisenman, 7301 Euclid Ave., Cleveland 3.

October 20-24, National Safety Council: National safety congress & exposition, Conrad Hilton Hotel, Chicago. Council address: 425 N. Michigan Ave., Chicago 11.

October 22-24, Porcelain Enamel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: DuPont Circle Bldg., Washington 6. Secretary: John C. Oliver.

October 22-24, Society of Automotive Engineers: National transportation meeting, William Penn Hotel, Pittsburgh. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

October 27-29, National Lubricating Grease Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute address: 4638 J. C. Nichols Parkway, Kansas City 2, Mo. Executive secretary: Harry F. Bennetts.

October 27-29, American Gear Manufacturers Association: Fall meeting, Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

October 27-30, American Gas Association: Annual meeting and exposition, Municipal Auditorium, Atlantic City, N. J. Association address: 420 Lexington Ave., New York 17. Secretary & convention manager: Kurwin R. Boyes.

October 27-31, Electrochemical Society Inc.: Fall meeting, Mt. Royal Hotel, Montreal. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

October 28-29, Materials Handling Conference: Westinghouse Electric Corp., sponsor, Hotel Statler, Buffalo.

October 30-31, National Association of Aluminum Distributors: Annual convention, Del Monte Lodge, Pebble Beach, Calif.

October 30-November 2, National Tool & Die Manufacturers Association: Annual meeting, Hotel Sheraton, Rochester, N. Y. Association address: 906 Public Square Bldg., Cleveland. Executive secretary: George S. Eaton.

NOVEMBER

November 3-4, Society of Automotive Engineers: National diesel meeting, Hotel Chase, St. Louis. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 5-7, Industrial Management Society: Annual time and motion study, and management clinic, Hotel Sheraton, Chicago. Society address: 35 E. Wacker Drive, Chicago 1.

November 5-9, Scientific Apparatus Makers Association: Mid-year meeting, industrial instrument, laboratory equipment, optical, aeronautical and military instrument sections. The Homestead, Hot Springs, Va. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

November 6-7, Society of Automotive Engineers: National fuels and lubricants meeting, The Mayo, Tulsa, Okla. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 8, American Society of Tool Engineers, Chicago Chapter: Annual midwestern tool engineering conference, Urbana, Ill. Conference arrangements: Prof. L. E. Doyle, University of Illinois.

November 8-9, Open Steel Flooring Institute Inc.: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 2311 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swennson.

November 9-11, Grinding Wheel Institute: Annual meeting, Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager F. A. Peterson.

November 9-11, Abrasive Grain Association: Annual meeting, Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 10-11, The Magnesium Association: Annual meeting and exhibit, Hotel Biltmore, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: (Miss) Martha I. Hansen.

November 10-13, The Wire Association: Annual meeting, Hotel Carter, Cleveland. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 10-14, National Electrical Manufacturers Association: Annual meeting, Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Secretary: W. J. Donald.

November 14, American Iron & Steel Institute: Regional technical meeting, Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

November 19, American Standards Association: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: G. F. Hussey Jr.

November 20-21, American Society for Personnel Administration: Fall meeting & exhibit, Hotel Schroeder, Milwaukee. Society address: 2917 E. 79th St., Cleveland. Secretary: Mary E. Hopkins.

November 21, Association of American Railroads: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

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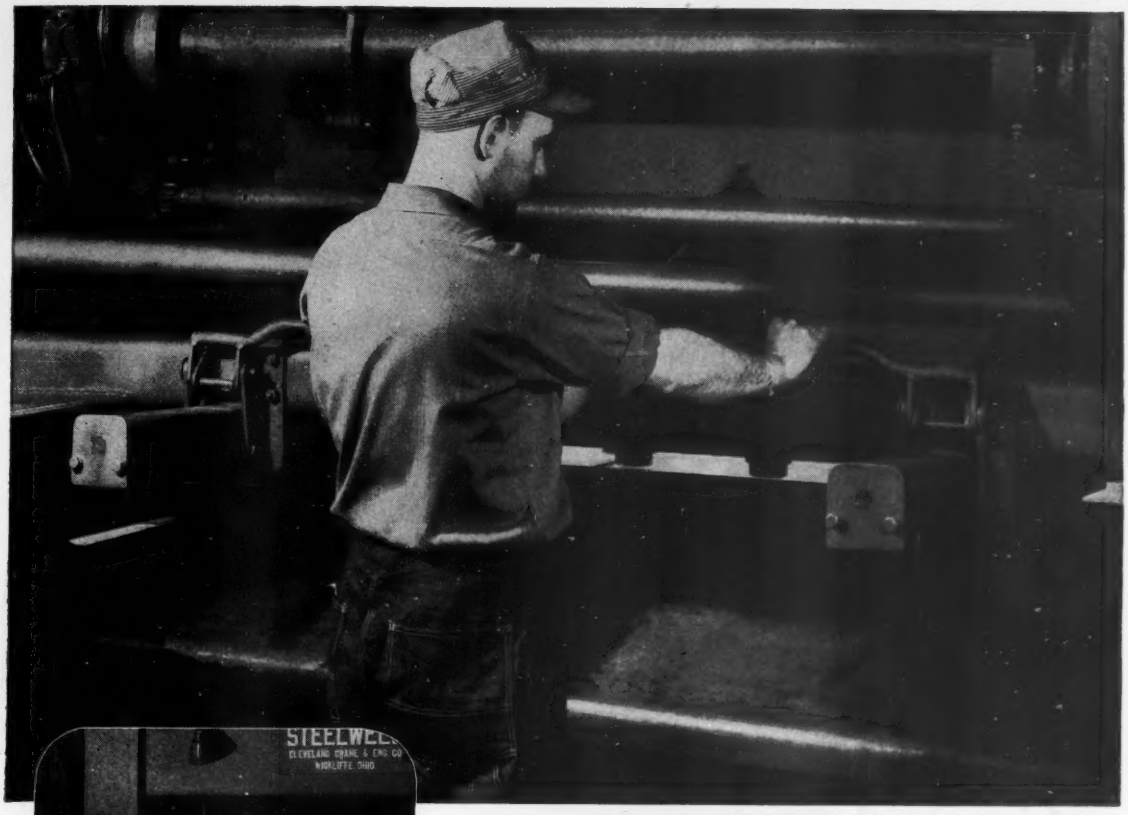

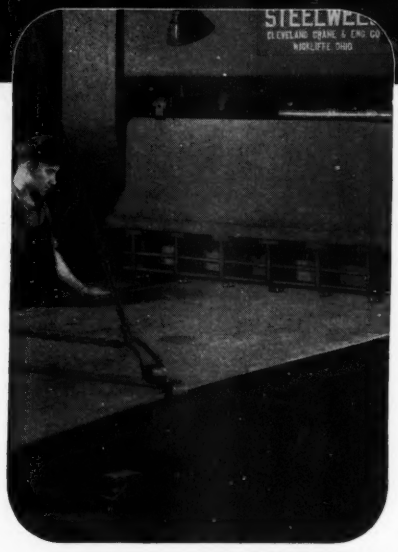

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Shear operators acclaim this back gauge which can be raised up and out of the way to allow long sheets to pass through. They like its smooth easy operation when setting it for use.

The back gauge is typical of many features that make Steelweld Pivoted-Blade Shears so outstanding. It is put in or taken out of service simply by the movement of a horizontal bar. No bolts to turn. No parts to assemble.

It is convenient to adjust, too. The operating crank and dials are at the outside front corner of the shear where readily accessible, eliminating need of going around to back of machine. It is mounted on ball bearings and equipped with an indicator which reads in inches and 1/100ths.

The back gauge is standard equipment supplied with all Steelweld Shears. Lift-up feature is furnished only for ⅜" capacity machines and larger. Metal cut on lighter machines is usually pliant enough to pass under a gauge without lift-up arrangement.

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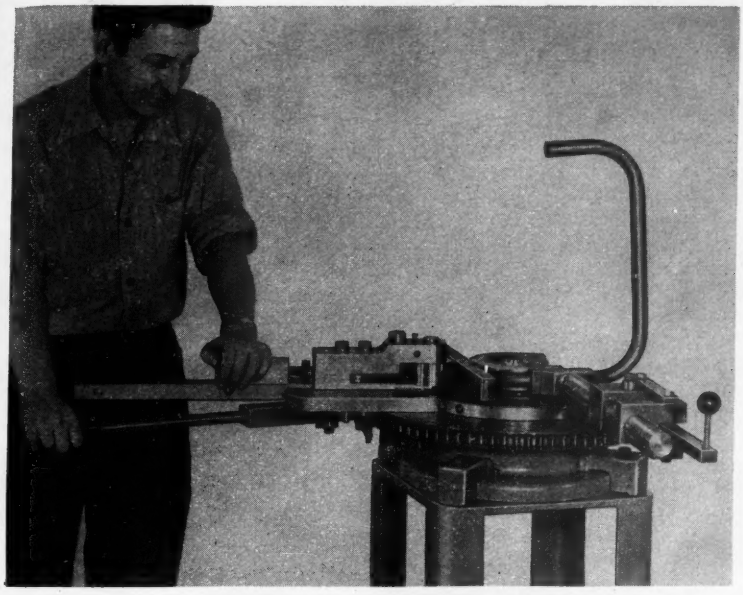


HANDLES HEAVY BENDING-OPERATIONS
. . . takes cold finished bars up to 1 inch; tubing up to 1¼ inches

Machine Bends 1¼-Inch Tubing

USE REPLY CARD—CIRCLE No. 1

If you need a machine for heavy bending operations where production doesn't warrant a power driven unit, here's one that bends cold finished bars up to 1-inch and tubing up to 1¼ inches.

The new hand-operated bender, introduced by O'Neil-Irwin Mfg. Co., 619 Eighth Ave., Lake City, Minn., provides a bending range of 0 to 12 inches. It features a built-in ratchet mechanism that can be engaged or disengaged by the operator depending on size of material being formed.

Engaging ratchet mechanism increases material capacity of the bender—multiplying the operator's effort by about four times. Disengaging it enables him to step up production of lighter materials.

The bender, known as the Di-Acro No. 4, is available with a special stand, and also with accessories for handling angles, channels, extrusions, moldings, strip stock, round or square stock.

Microfilmer Files Records

USE REPLY CARD—CIRCLE No. 2

Business documents can be condensed photographically to 1/40 their original size with the Recordak Bantam microfilmer announced by Eastman Kodak Co., Rochester 4, N. Y. At this reduction ratio as many as 29,000 checks can be filed on a 100-foot roll of 16-mm film. In addition, accessory lenses are easily interchanged for reductions of 19, 24 and 32 to 1. Film chamber is located conveniently in the machine's top for easy loading and lens interchange.

At the two higher reductions, the duo method of microfilming is employed. Half the film is exposed on the first run; the roll is then reversed and documents recorded down the other side. At the two lower reductions, the standard method is used.

An automatic document feeder that feeds stacks of material from small reference cards to letters and statements is built into the unit. Insertion rate reaches 500 per minute. The machine accepts documents up to 11 inches wide; length is unlimited.

Conveyor Centers Material

USE REPLY CARD—CIRCLE No. 3

New V-conveyor is announced by Alvey Conveyor Mfg. Co., 9301 Olive Street Rd., St. Louis 24, Mo. Material traveling on the conveyor is automatically centered. Each roller is slightly tilted with alternate rollers tilted in opposite directions to form a trough.

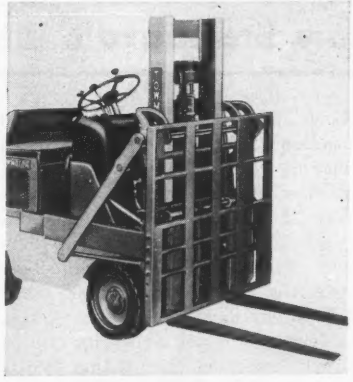
Pipe, bars, shapes, shells and other similar items roll easily forward without the necessity of a side guard.

Conveyors are made in various widths and roller load capacities to suit varying requirements.

Lift Accessory Eases Loading

USE REPLY CARD—CIRCLE No. 4

Rapid and completely mechanical unloading of widely varied number of materials is handled smoothly by an unloader attachment developed as a standard truck accessory by Towmotor Corp., 1226 E. 152nd St., Cleveland, O. Completely controlled from the driver's seat, the unloader is designed to streamline loading of freight cars, transport trucks and to simplify placing materials in storage. The unit



DRIVER-CONTROLLED LOADER
. . . designed to simplify freight handling

REPLY CARDS

on page 135 will bring you more information on any new products and equipment in this section.

A century of achievement . . .

Studebaker's big, modern South Bend plant symbolizes the century of growth and achievement which have earned for this company an enviable reputation for high quality products and world-wide recognition as America's fourth largest manufacturer of automobiles.

How Standard's lubrication service works for Studebaker

• Look almost anywhere in Studebaker's vast plant at South Bend, Indiana, and you'll see Standard's lubrication service at work.

In one of the many operating departments, the chances are you'll find the Standard lubrication specialist who serves Studebaker. He is assigned to the South Bend area and is close-at-hand to give Studebaker the lubrication engineering assistance they need when they need it.

Almost any day at Studebaker's, you'll see a Standard tank wagon or truck delivering the petroleum products that help keep production rolling. Because these deliveries are made from a nearby Standard warehouse, they are prompt and reliable. Most of the petroleum products used in the Studebaker plant are stocked in this warehouse and are immediately available.

All along Studebaker's assembly and production lines, you'll find Standard Oil products at work. From one of the most complete lines of fuels and lubricants on the market, Studebaker has been able to select the petroleum products that exactly fit its needs.

All of these benefits—expert engineering service, fast and reliable deliveries, a complete line of high quality products—add up to one of the reasons why Studebaker has been a Standard Oil customer for over 50 years. Make Studebaker's experience the basis for putting Standard's lubrication service to work for you. Just phone your local Standard Oil (Ind.) office and ask to have the Standard Oil lubrication specialist in your area call on you.

What's YOUR problem?

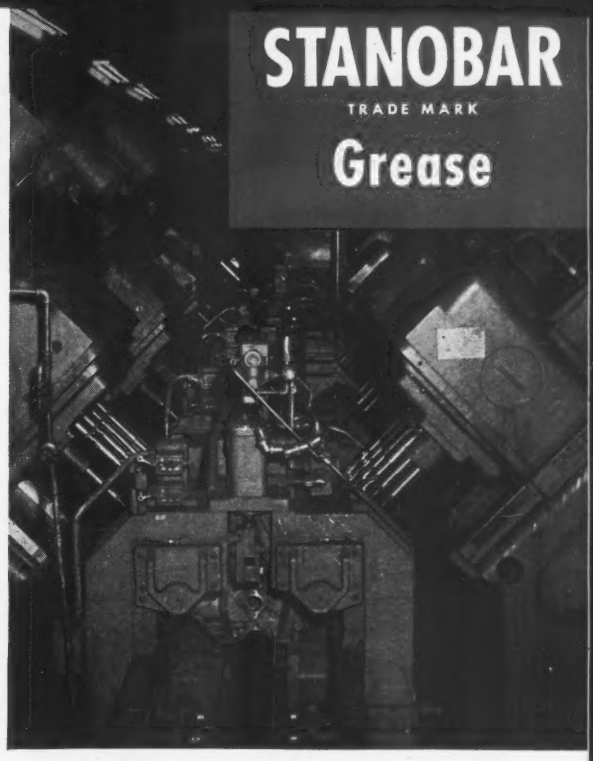
Russ Jenkins (left), lubrication specialist from Standard's South Bend office, and Studebaker's Paul Izdepski work closely together to get best results from Standard's fuels and lubricants.

Wherever your plant is situated in the Midwest, there is a Standard lubrication specialist close-at-hand who will work hand-in-hand with you on lubrication problems. Right in your neighborhood, too, you'll find a Standard office and warehouse. It makes immediately available to you a reliable supply of petroleum products. Phone your local Standard office soon, and find how you can profit through Standard's unique industrial lubrication service.

STANDARD

STANDARD OIL COMPANY
(INDIANA)

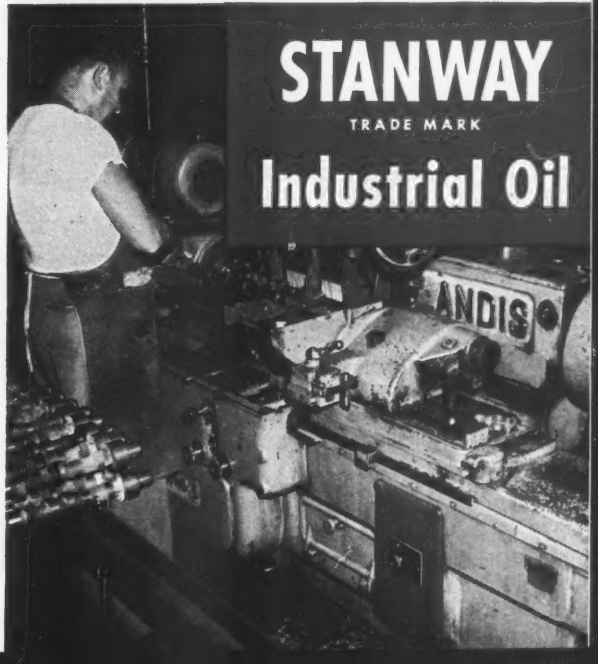
STANOBAR
TRADE MARK
Grease



STANOBAR GREASE is used throughout the Studebaker plant for lubrication of bearings in electric motors and oil pumps. Its high stability enables it to provide effective lubrication under a wide variety of operating conditions.

In Studebaker's many grinding machines, such as the one shown below, STANWAY Industrial Oil No. 30H answers a special need by serving both as a hydraulic oil and as a lubricant for ways and guides. The high stability necessary in a hydraulic oil and the oiliness needed in a way lubricant are uniquely combined in STANWAY.

STANWAY
TRADE MARK
Industrial Oil



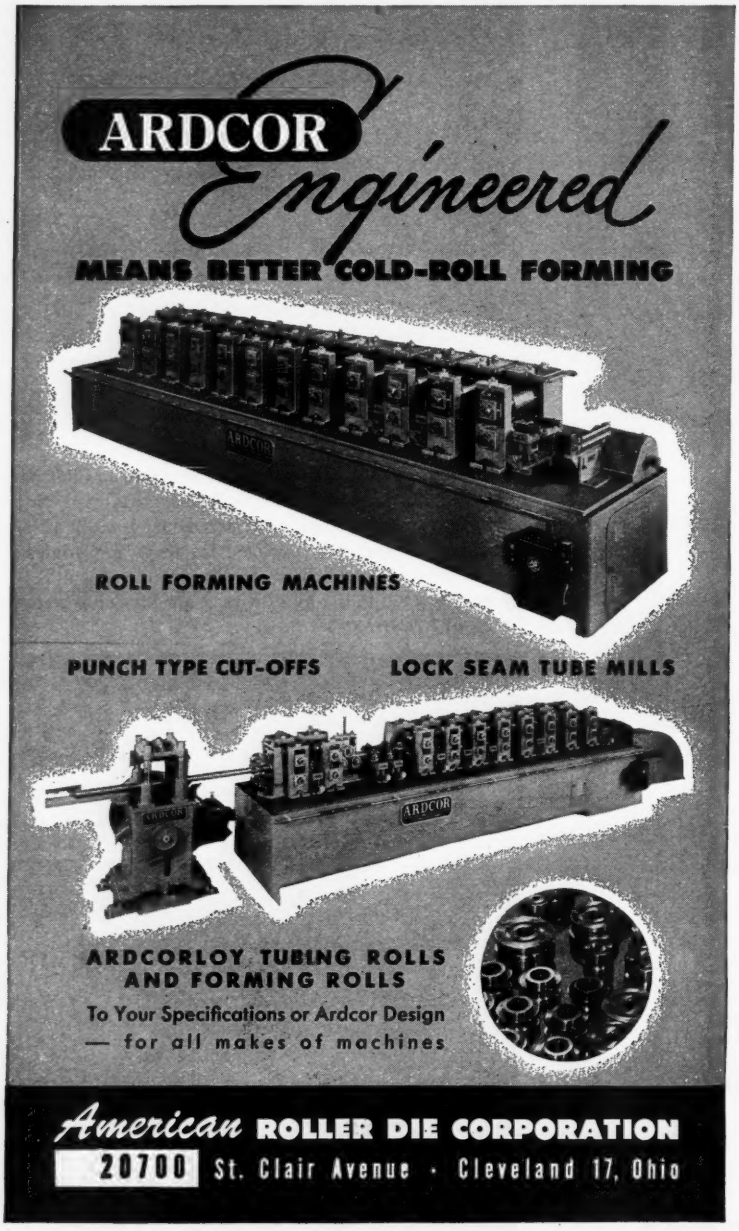
is compactly designed to assure unhampered truck operations. It can be furnished for most of the firm's truck models.

Refinery-Type Limitamp

USE REPLY CARD—CIRCLE No. 5

Redesigned refinery-type limitamp is announced by General Electric Co., Schenectady 5, N. Y. Use of a manually-operated, oil-immersed, explosion-proof disconnect switch in the primary circuit of the control transformer eliminates additional cubicle required previously for control power. This, plus a shallow enclosure, permits a 60 per cent reduction in size.

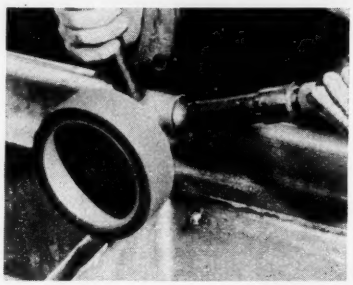
The unit features a vented explosion-proof case housing the temperature compensated thermal overloads, time delay undervoltage relay and low-voltage control power fuse. Design consists of a sheet metal enclosure with vents that permit passage of air but block flame effectively by labyrinth construction. Other essential construction characteristics include complete squirrel-cage motor starter for either full or reduced-voltage starting and isolation of high and low voltage circuits by suitable barriers.



Lightweight Drum Sander

USE REPLY CARD—CIRCLE No. 6

Availability of an 8-inch diameter by 2-inch wide lightweight drum sander is announced by American Diamond Saw Sales, Portland, Oreg. The Cone-Loc unit, when operated at speeds that approximate 3500 rpm, provides more than 7000 sfm cutting speed with coated abrasives. The tool weighs



. . . 7000 sfm cutting speed at 3500 rpm

3½ pounds and can be applied satisfactorily with portable grinding equipment.

Sander is a split drum type tool that permits use of coated abrasives strips. Maximum speeds reach 5000 rpm.

Electric Valve Controls

USE REPLY CARD—CIRCLE No. 7

Constructed to give reciprocating linear movement of the drive shaft, a new line of gate, angle, butterfly and linear valve controls is announced by Janette Electric Mfg. Co., Morton Grove, Ill.

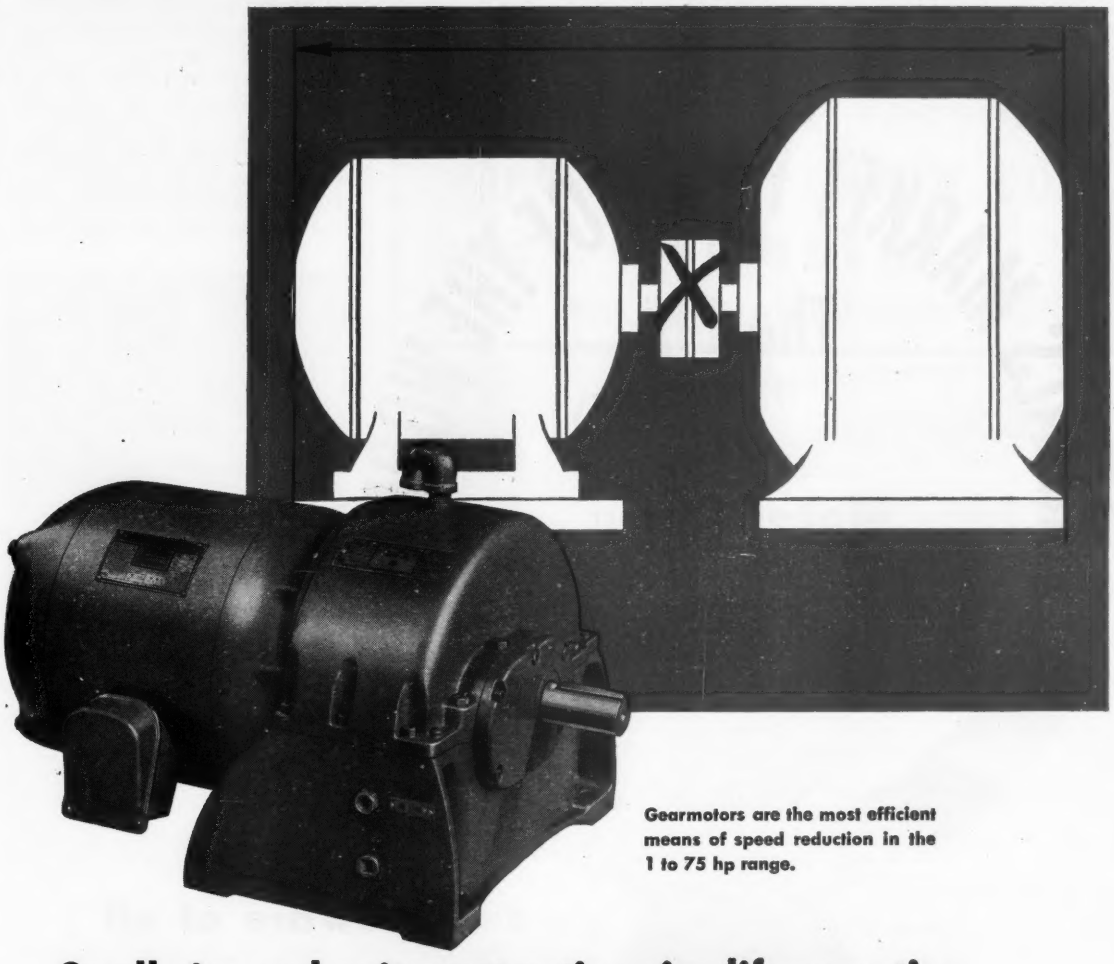
Units are designed for operating sliding cams, ventilating covers, hatches, large windows, floor lifts, doors and gates.

They are available in ratings from ⅛ to 1 hp.

Gear-Type Coolant Pumps

USE REPLY CARD—CIRCLE No. 8

Graymills Corp., 3705 Lincoln Ave., Chicago 13, Ill., offers a line of gear and centrifugal coolant systems. These units are available as part of a complete system in-



Gearmotors are the most efficient means of speed reduction in the 1 to 75 hp range.

Small size and unit construction simplify mounting of Life-Line GEARMOTORS

Gearmotors provide the ultimate in compactness. Life-Line Gearmotors give you this compactness, plus many exclusive features not available in any other make. When mounting space is at a premium—Life-Line Gearmotors simplify the problem.

They are self-contained . . . can be installed quickly and conveniently. There's no handling, mounting and aligning of a separate motor, coupling and subbase or bedplate.

Life-Line Gearmotors also offer you these advantages: fewer moving parts, require less maintenance—are easier to inspect and service—are designed, built and serviced by ONE manufacturer.

Use the most efficient means of speed reduction. Use Life-Line Gearmotors. Call your Westinghouse representative for the facts, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-07310

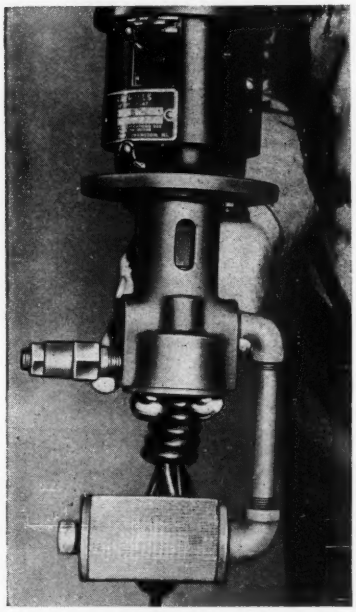
YOU CAN BE SURE...IF IT'S Westinghouse

Life-Line GEARMOTORS

OCTOBER 20-24 • PHILADELPHIA, PA.

cluding tank, hose and fittings for quick attachment to machine tools. Pump and motor units are supplied for immersion use in much the same way as an immersion type centrifugal.

Pumps can be mounted with intake above liquid level and a standard pipe dropped into the coolant. The pumps are self-priming and



. . . positive gear alignment assured

are supplied with relief valves. Among improved features is assurance of positive alignment. Models offered include 1/25, ¼ and ½-hp pumps, delivering from 1 to 3 gpm. Pressures range from 20 to 100 psi.

Compressor Line Expanded

USE REPLY CARD—CIRCLE No. 9

Portable compressors in its Gyro-Flo line are expanded an additional three sizes by Ingersoll-Rand Co., Broadway 4, N. Y. Units introduced are the 315, 210 and 105 cfm models. All apply the firm's rotary sliding-vane design.

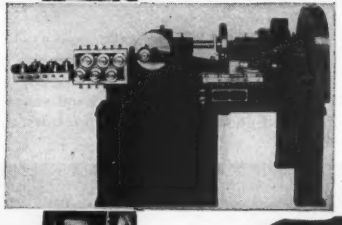
The manufacturer emphasizes operating simplicity and minimum maintenance. Smaller dimensions, reduced weight and discharge temperatures reaching 100°F lower than conventional are responsible for these characteristics. Air is discharged at less than 200°F

8 important reasons why WHITNEY CHAIN CO. uses SHUSTER

WIRE STRAIGHTENERS & CUT OFFS

Whitney Roller Chain Pins, made on SHUSTERS, can be stood end on end, the cut is so true and clean.

1. Each SHUSTER delivers 7500 Whitney Roller Chain pins per hour.
2. Whitney Chain standards of length tolerances are easily maintained.
3. Straight lengths and square cut ends speed up assembly operations.
4. Each SHUSTER can be set for lengths from 0 to 10".
5. Fully automatic controls increase man-hour production.
6. Uses economical mill coiled rod stock. Costs less than mill straightened stock.
7. Pins are made as needed, simplifying inventory—keeping production on schedule.
8. SHUSTERS have generation-long dependability.



SHUSTER Automatic Slide Feed Machines such as these used by Whitney Chain, are specifically designed for accurate and square cutting of short lengths. SHUSTERS are available to handle round stock from .025" dia. to 11/16" dia. and up to 40' cut off length. Also shapes and tubing.

SHUSTER Since 1866

AUTOMATIC WIRE STRAIGHTENING & CUTTING MACHINES

Manufactured by METTLER MACHINE TOOL, INC.
1325 LAWRENCE ST., NEW HAVEN, CONN.

Technical Data on Request

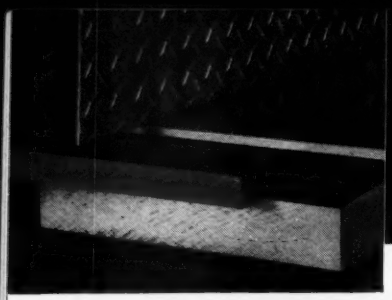
Mettler Machine Tool, Inc.
1325 Lawrence St., New Haven, Conn.

Gentlemen: Please send us technical data.
We use wire from ...." to ...." dia. in lengths from ..... to .....

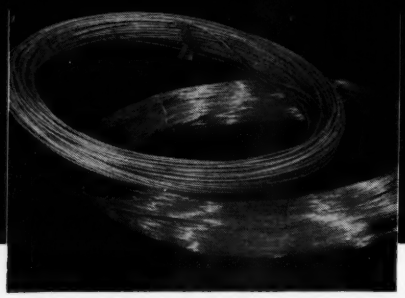
Name: .....

Company: .....

Address: .....



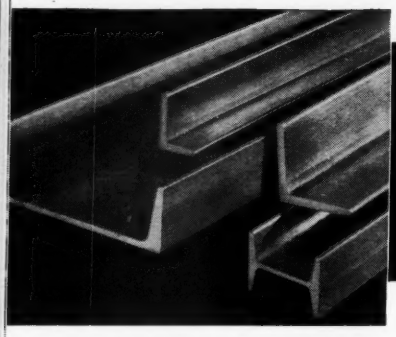
SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



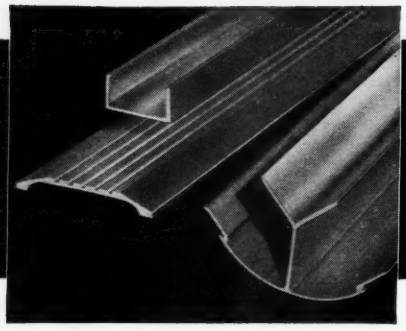
WIRE: Coiled and straight lengths; rivet wire; flattened and slit wire.

SCREW MACHINE STOCK: All free-cutting alloys plus the higher strength alloys—24S, 61S and 75S.

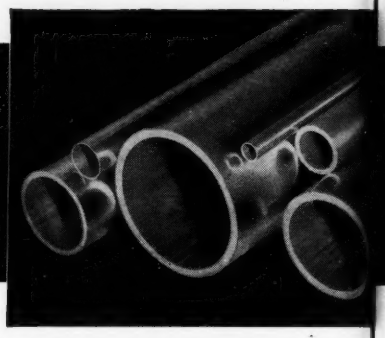
These are the MILL PRODUCTS of ALCOA



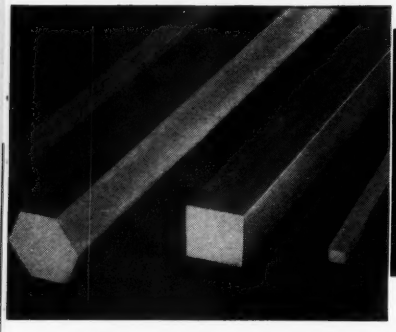
ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.



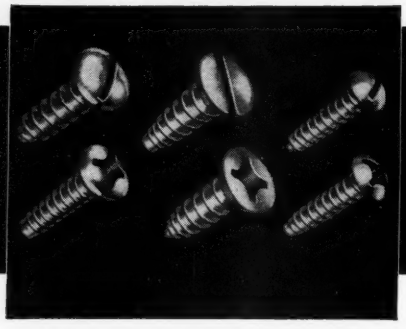
EXTRUDED SHAPES: Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners and structural members, etc. Round, square, and rectangular bars.



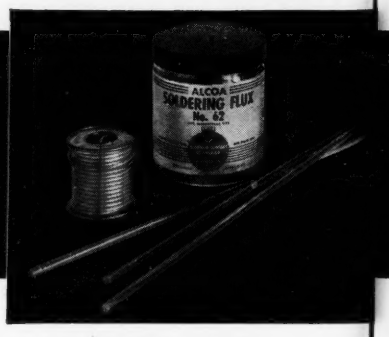
TUBE AND PIPE: Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.



BAR STOCK: Square, hexagonal and rectangular bar stock in free-cutting and higher strength alloys.



FASTENERS: Machine screws; wood screws; washers; nuts; bolts; rivets.



WELDING AND SOLDERING SUPPLIES: Welding and brazing wire; welding and brazing flux; solder flux; solder.

ALUMINUM COMPANY OF AMERICA

They have

these twelve basic advantages and scores of others

- Lightweight
- High Resistance to Corrosion
- High Electrical Conductivity
- High Conductivity for Heat
- High Reflectivity for Light and Radiant Heat
- Workability
- Nontoxic
- Strength in Alloys
- Nonsparking
- Nonmagnetic
- Appearance
- High Scrap and Re-Use Value

ALCOA

A·C·O·A ALUMINUM

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With them

goes the skill of 64 years' experience in fabricating, assembling and finishing aluminum

The world's greatest aluminum research and testing facilities are available to help you determine the suitability of aluminum for your products. And to train your personnel, Alcoa offers technical literature and how-to-do-it movies.

They are

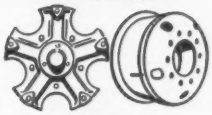
available from your local ALCOA sales office, distributor or jobber

For all possible co-operation in filling your orders, call your local Alcoa sales office, distributor or jobber. You'll find them listed under "Aluminum" in your classified phone book.

ALUMINUM COMPANY OF AMERICA
1808J Gulf Bldg. • Pittsburgh 19, Pa.

ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION

CASTINGS . . .
sand, plaster, permanent mold and die.



FORGINGS . . .
drop, hammer and press forgings.

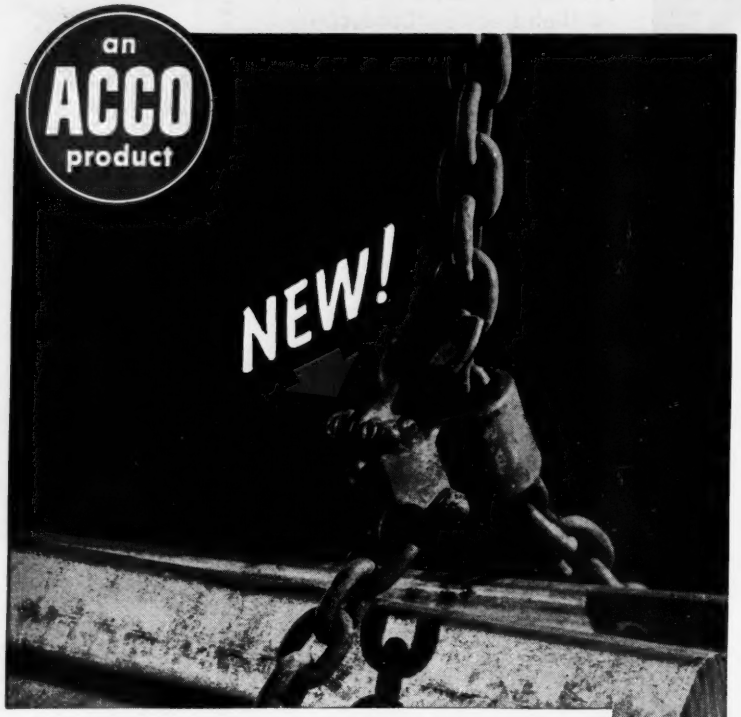
SCREW MACHINE SPECIALTIES . . .
special fasteners and screw machine parts.

IMPACT EXTRUSIONS

EXTRUDED SHAPES

"SEE IT NOW" with Edward R. Murrow — CBS-TV every Sunday . . . brings the world to your armchair. Consult your newspaper for local time and channel.

ALCOA *first in* ALUMINUM



Lock 'em—and Leave 'em

● If you have a problem lifting, moving or containing bundles of bars, rods, or pipes—forget it. Get some of the new AMERICAN Bundling Chains with automatic locks. They're easy to hook up, and once you lock them, they stay locked. Yet you can unlock them with a flip of the fork. Satisfied users tell us they have made possible real savings in handling costs.

Write today for information on Bundle Locks or the 1001 other items in the complete AMERICAN Chain line.

(Patent Pending)

ACCO

AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

American Chain

TRADE MARK

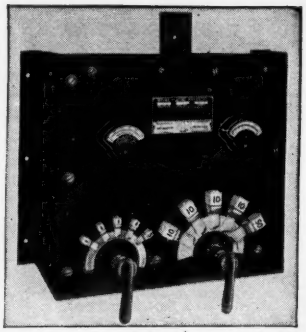
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.

under normal operating conditions. This, with thorough oil separation, eliminates hose deterioration caused by heat and oil. Continuous rotary action provides a steady flow of air without pulsation or vibration.

Meter Charts Plating Deposit

USE REPLY CARD—CIRCLE No. 10

Accurate determination of plating deposit at all points on any article before plating, is made simple and rapid by a current density meter offered by Belke Mfg. Co., 947 N. Cicero Ave., Chicago 51, Ill. Instrument has three



. . . three test leads for surface attachment

test leads for surface attachment at spots such as sharp points where burning may occur and in deep recesses. By turning a dial switch on the meter, amperes per square foot can be read at each test point.

Comparison of readings with current density chart for the solution quickly indicates whether plating is too high or low at any of the selected test points. Nine scales are used, with ranges from 0-3 to 0-3000 amperes per square foot.

Small Part Tumblers

USE REPLY CARD—CIRCLE No. 11

Tumbling barrel built with individual pockets for tumbling from 2 to 6 items at a time is offered by Tumb-L-Matic Inc., 4510 Bullard Ave., New York 70, N. Y. The Pocket Tumbler is recommended for deburring, precision finishing and polishing small metal and plastic parts.

Construction employs a rotating

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
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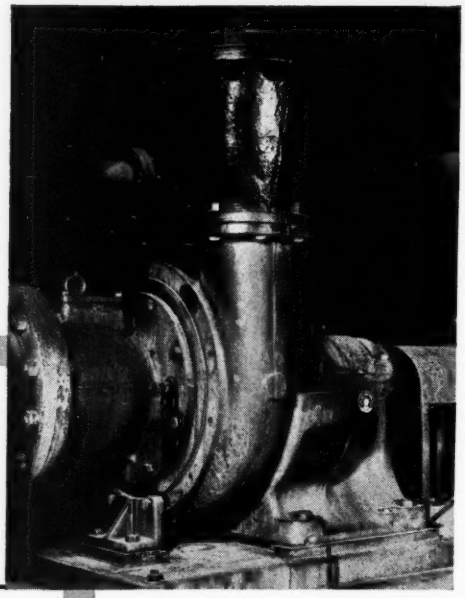
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

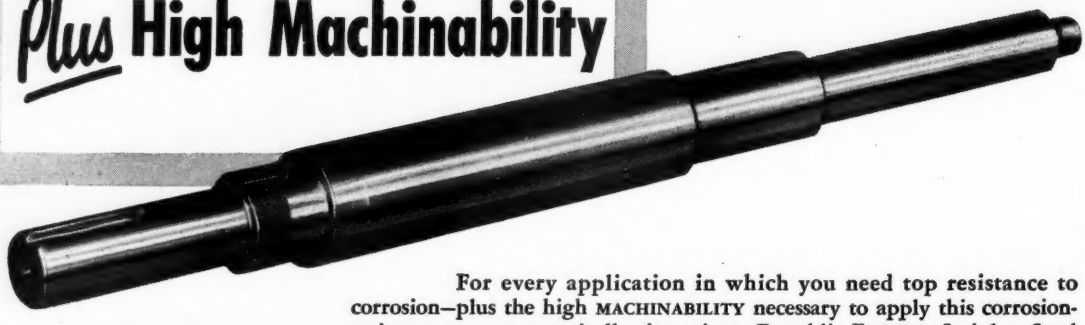
Designers and builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

Free-Machining ENDURO gives you—

THE CORROSION-RESISTANCE OF STAINLESS STEEL



Plus High Machinability



For every application in which you need top resistance to corrosion—plus the high MACHINABILITY necessary to apply this corrosion-resistance most economically—investigate Republic ENDURO Stainless Steel . . . in cold finished or hot rolled bars, and in wire.

Free-Machining ENDURO bars are cold finished by Republic's Union Drawn Steel Division to provide close tolerances, accuracy of section, uniform soundness and fine surface finish . . . plus the high physical and chemical properties of stainless steel. Two grades are fully 90% as machinable as Bessemer screw stock!

Republic metallurgists are ready now to give you prompt assistance on Free-Machining ENDURO Stainless Steel bar applications, processing and use. Contact them through your nearest Republic District Sales Office, or write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Now . . . see and hear

"THE STORY OF STAINLESS"

Full color 16mm sound film
27 minutes running time

The dramatic story of the discovery of stainless steel . . . how early production problems were solved . . . how the long-lasting metal grew to its present-day importance. Republic Steel's new film is available for showing to qualified groups, without charge. Requires 16mm sound projector. Send name of organization or group, type of projector, requested date, to: Ideal Picture Corp., 65 East South Water Street, Chicago 1, Ill.; or write Republic Steel, Dept. K, Cleveland 1, Ohio.

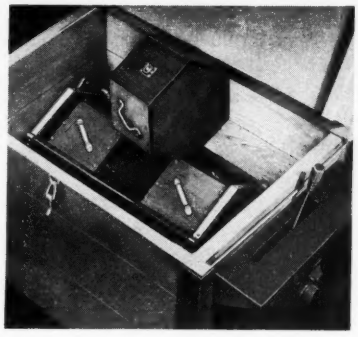
Republic ENDURO® FREE-MACHINING STAINLESS STEEL

REPUBLIC STEEL®

Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

container or frame into which the pockets fit. Both pockets and frame are hexagon-shaped. Frame is enclosed on three sides during tumbling to hold the pockets in place, one side opening to permit pockets to be inserted and removed.

Pockets are equipped with handles to ease handling. Types available include the submerged unit



. . . individual pockets take 2 to 6 items

shown above for wet tumbling and a self-contained type that can be adapted for either wet or dry operation. The latter does not have the outer box-container, but water can be added into individual pockets when desired. In addition, wet and dry process barrels can be operated simultaneously.

Angle Aids Blind Riveting

USE REPLY CARD—CIRCLE No. 12

Expanding the scope of blind riveting to many additional assembly and maintenance applications, Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich., has added a new angle adapter to their line of riveting equipment.

One person from one side of the work can now drive 1/8, 5/32 and 3/16-inch self-plugging or pull through blind rivets in a clearance space of only 4 inches from the nose of tool to back face of adapter.

Chilling Chamber Modified

USE REPLY CARD—CIRCLE No. 13

To obtain maximum heat transfer, a modification of the chilling chamber in its industrial chilling machine is announced by Sub-Zero Products, Cincinnati 29, O. Principal result is to obtain complete

cool this quench oil tank for 1/3 the cost

At the K-D Manufacturing Company, a manufacturer of metal stampings, Platecoils were installed in an oil quench tank for only 1/3 the cost quoted by a standard heat exchanger manufacturer. Three hundred pounds of material per hour had to be quenched from 1600 °F. to 140 °F. with the quench oil being recirculated at 15 gpm. The Platecoils were specified to maintain oil temperature of 110 °F. using 75° cooling water at 6 gpm.

The efficiency of the Platecoils exceeded expectations, reducing the oil temperature to 85 °F. within 25 minutes. According to Mr. Madeira, Tool Room Foreman: *"Under extreme summer temperatures and the largest loads ever quenched, the installation maintained the desired quench temperatures."*

The reason Platecoils cost so much less is they have so much more effective heating or cooling area in a limited space. For instance, a 22" x 47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe which would require approximately 30" x 60" of space. Thus a Platecoil only half the size often provides a much greater BTU transfer per unit area. This means savings in initial cost, tank space and installation time.

Everywhere that Platecoils are used the story is always the same: They heat or cool faster, can be installed quicker at only a fraction of the cost of other methods. Write for Bulletin No. P72.

PLATECOILS gives you these ADVANTAGES

Cleaned and Repaired Without Dumping Tank Solution
Greater BTU Transfer Per Unit Area
Weighs Only Half as Much as Pipe Coil
No Threaded Joints in Tank
Increased Tank Capacity
Fast, Easy Installation
Easy to Clean

circulation of the convection fluid in the chamber six times per minute. Circulation is effected by a mixer mounted in the chamber's left rear corner. A three-blade, 4-inch propeller, the mixer is enclosed in an 8-inch draft tube with 6½ inches clearance at the bottom and a minimum 2 inches clearance between the top of the tube and the fluid level.

A fillet is mounted in the bottom corner to direct the fluid flow across the chamber bottom. The mixer is powered by an external top-mounted motor. Modification is available on special-size units and on the standard model R-120.

Round-Chart Recorder

USE REPLY CARD—CIRCLE No. 14

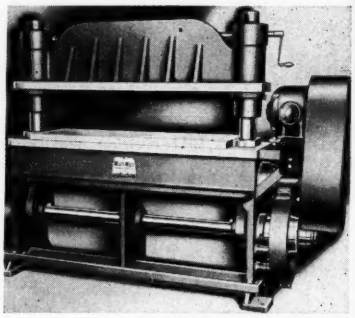
Bristol Co., Waterbury 20, Conn., announces addition of round-chart recorders and automatic controllers to its line of electronic Dynamaster potentiometers and bridge instruments. The round-chart models are high-speed, continuous-balance, null-type electronic instruments that can be used to measure any variables that can be translated into an electrical quantity.

The measured variable is recorded simultaneously on a 12-inch diameter chart and indicated on a large circular scale which is legible at a distance. Models are offered for full-scale pen travel in 7, 3, 1½ or 2/3 seconds. Recording mechanism is on the front of a hinged aluminum alloy panel that can be swung out to gain easy access to components.

Punch Press Line Expanded

USE REPLY CARD—CIRCLE No. 15

Rating of 80 strokes per minute is possible on a 30-ton punch press added to the line made by Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif. Model



. . . model hits 80 strokes per minute

3060 has positive brake and counterbalance with equilabrator, is built with all herringbone gears. Other features include a four-point engaging clutch and electrically-operated clutch control. The unit offers simple conversion into a power-squaring shear.

Bed size is 15½ x 61¾ inches; ram size, 10 x 60¾ inches. Shut die height is determined by specific order, maximum being 24 inches.

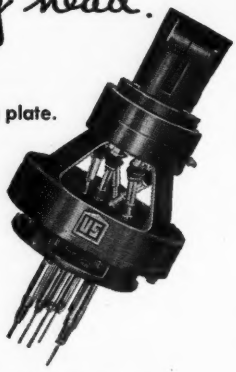
Finish for Iron and Steel

USE REPLY CARD—CIRCLE No. 16

Parco Black, a jet black corrosion resistant finish for iron and steel, is announced by Parker Rust Proof Co., Detroit 11, Mich. It is used in water solution at low temperatures. Parts are immersed for 15 to 30 minutes in the processing

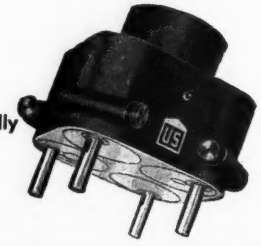
COMPARE THE PRICE....
AND PERFORMANCE.....
and you'll rely on us for any type of multiple spindle fixed center, adjustable or individual lead screw tapping head.

Universal joint with slip spindle fixed locating plate.



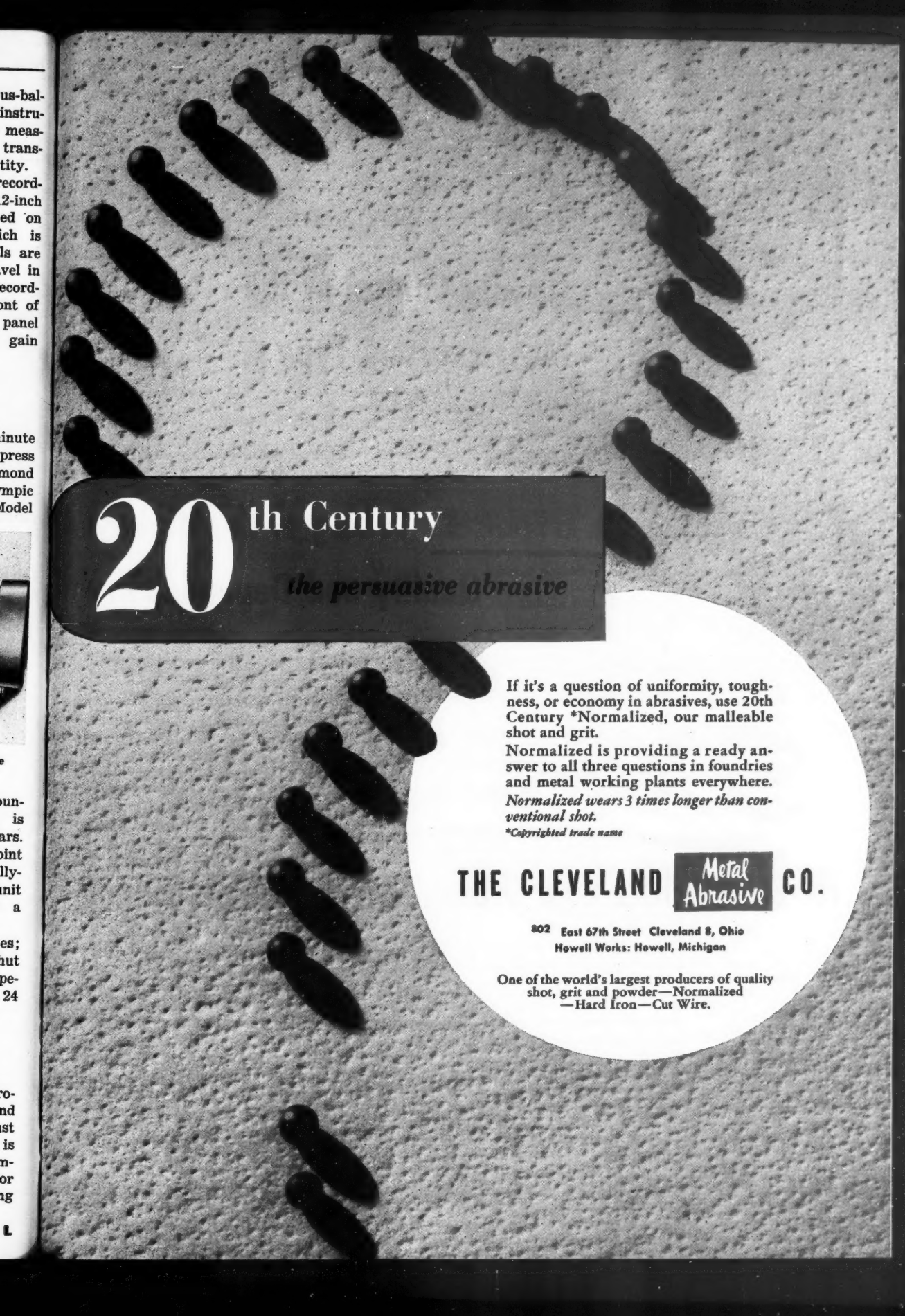
Two spindle head unit—one spindle fixed, the other spindle adjustable for the fixed positions.

Single eccentric type for equally spaced holes on bolt circles.

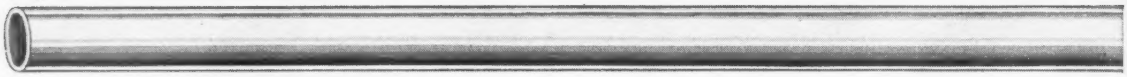


US HEADS
SINCE 1915

UNITED STATES DRILL HEAD CO.
CINCINNATI 4, OHIO

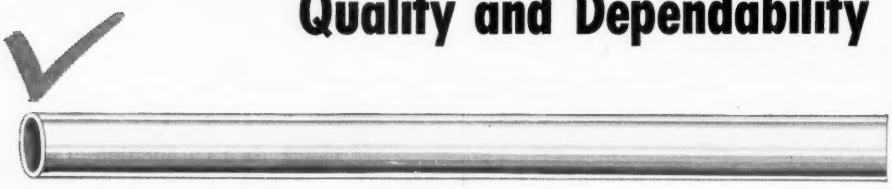

20th Century
the persuasive abrasive
If it's a question of uniformity, toughness, or economy in abrasives, use 20th Century *Normalized, our malleable shot and grit.
Normalized is providing a ready answer to all three questions in foundries and metal working plants everywhere.
Normalized wears 3 times longer than conventional shot.
*Copyrighted trade name
THE CLEVELAND Metal Abrasive CO.
802 East 67th Street Cleveland 8, Ohio
Howell Works: Howell, Michigan
One of the world's largest producers of quality shot, grit and powder—Normalized —Hard Iron—Cut Wire.

✓ The Modern Facilities of a New Plant



Plus Quality Control of the Most Exacting Type

Produce Tubing of the Highest Quality and Dependability



SCORE 3

for SUMMERILL Cold Drawn Seamless Steel Tubing

Our product range covers the fields of mechanical, pressure, aircraft and diesel tubing—in sizes up to 1½" outside diameter. If you're a user of these items, we'd like to make the point that our new plant these days is shipping out the finest tubing in Summerill history (*that's saying something!*) . . . and that you can be definitely sure of trouble-free material when you specify Summerill. ● Let us supply your tubing footage requirements. Mechanical and aircraft grades are available on faster deliveries than our other lines.

Summerill TUBING COMPANY DIVISION
COLUMBIA STEEL & SHAFTING COMPANY
Pittsburgh 30, Pennsylvania

WBD 4183

SPECIALIZING IN COLD DRAWN SEAMLESS STEEL TUBING

bath, rinsed and dried. After oiling or waxing, deep black durable finish is ready for service.

Alarm Silencing Relay

USE REPLY CARD—CIRCLE No. 17

An alarm silencing relay that is automatically reset is available from Industrial Division, Minneapolis-Honeywell Regulator Co., Philadelphia, Pa. It provides a method for shutting down the alarm while insuring automatic reset when alarm condition is corrected. A red pilot light on relay warns until the alarm circuit has been cleared.

50-Ton Hydraulic Jack

USE REPLY CARD—CIRCLE No. 18

Hein-Werner Corp., Waukesha, Wis., introduces a 50-ton hydraulic jack equipped with positioning handles. It is recommended for straightening and leveling operations, heavy duty compressing and similar jobs where powerful force is needed.

Valve Checks Gas, Air Lines

USE REPLY CARD—CIRCLE No. 19

A check valve for gas or compressed air lines, flanged or screwed ends, is available in sizes 4 to 16 inches. Made by Techno Co., Erie, Pa., valve is seatless and closure is absolute. There are no wearing parts, seats to renew or grind and no stems or packing to cause leakage.

Tool Bit Installation Simplified

USE REPLY CARD—CIRCLE No. 20

Slotted sleeve for simplifying the installation of tool bits in boring bars, tool holders and cutter heads, is offered by Novi Tool & Machine Co., Novi, Mich. It can be used for square tool bits as well as rectangular ones. Sleeves are available in sizes for bits from 3/16 to 1 inch in width and 1 to 4 inches in length.

Heat Exchanger Tee

USE REPLY CARD—CIRCLE No. 21

Crawford Fitting Co., Cleveland, O., offers Swagelok heat exchanger tee for steam jacketing or temperature control of process lines. Small end of the fitting has been bored through to allow the tube to pass completely through the jack-

CHALLENGE US!

Security Locknuts installed on a large Tornadyne clutch for one of the large mechanical presses made by the Clearing Machine Corp. of Chicago. Before using Security Locknuts the fasteners had to be wired in place.

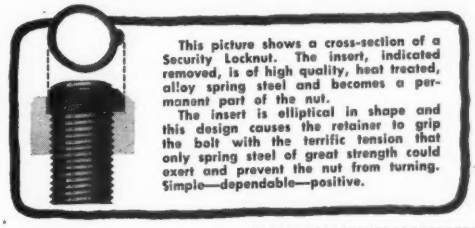
WHAT is your fastener problem? Are you wiring nuts in place? Are you paying the extra cost of installing cotter pins? Are you peening the ends of bolts and making removal or repair difficult?

Challenge us to solve that fastener problem! We are doing it for others and can do it for you.

We would like to have you see the results of tests that have proved the Security Locknut practically vibration proof. A Security Locknut holds and stays "put" even in the face of vibration that destroys the bolt. Security Locknuts can be adjusted and re-adjusted any number of times but more important, they can be removed and re-used over and over again without materially losing their locking power and without damage to the bolt.

If you have a vibration or fastener problem accept our challenge. Ask for a sample Security Locknut. Send the coupon. No obligation, of course.

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.



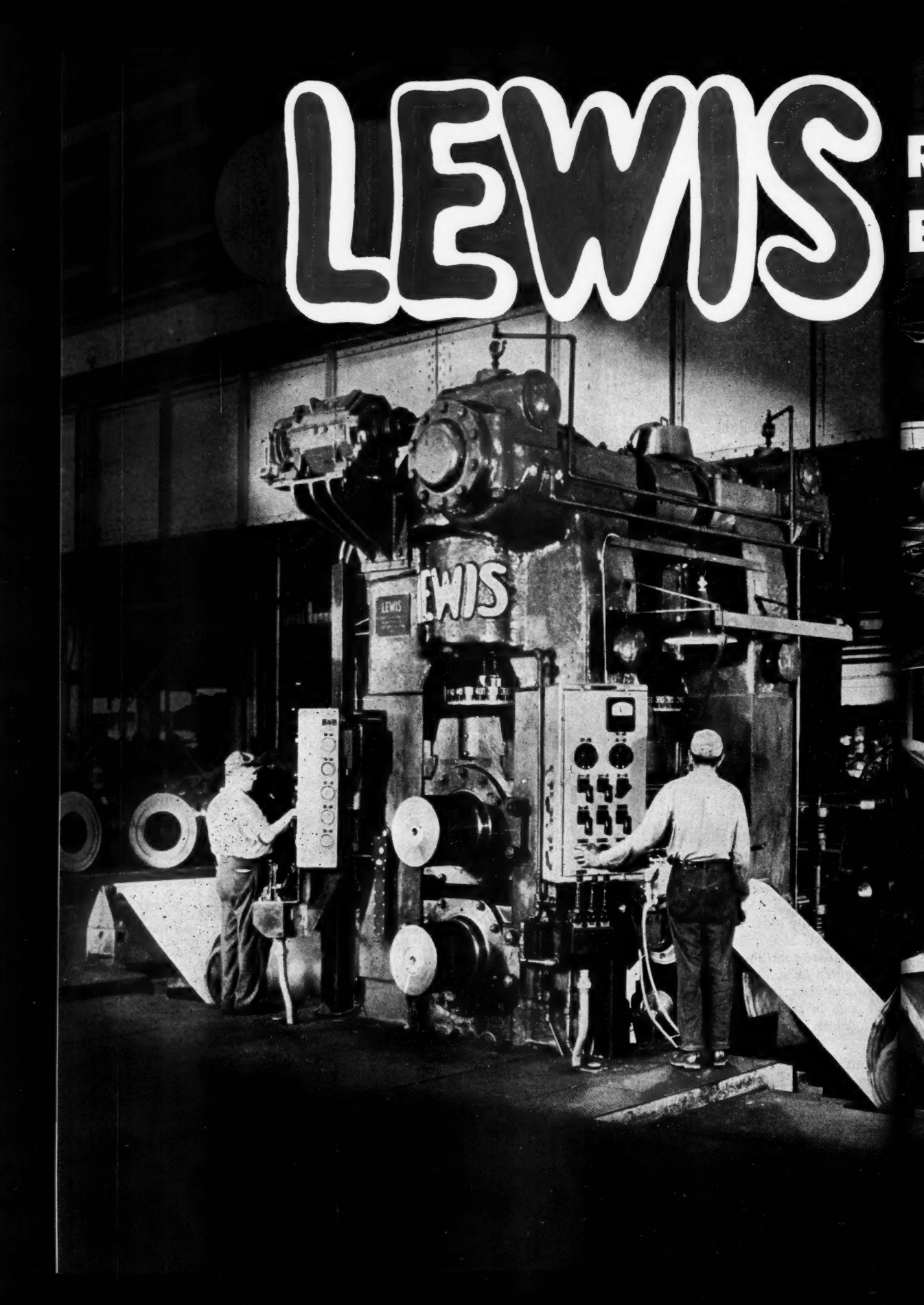
This picture shows a cross-section of a Security Locknut. The insert, indicated removed, is of high quality, heat treated, alloy spring steel and becomes a permanent part of the nut.
The insert is elliptical in shape and this design causes the retainer to grip the bolt with the terrific tension that only spring steel of great strength could exert and prevent the nut from turning. Simple—dependable—positive.

SPECIAL OFFER!

Here's an easy way to arrive at thread tolerance figures. Ask for a Security Thread Tolerance Chart. Just spin the dial and you have the figure you need. Send the coupon. It's yours for the asking.

SECURITY LOCKNUT CORPORATION
No:th Ave. and 15th Ave., Melrose Park, Ill.
Please send me without obligation:
☐ One of your Thread Tolerance Charts.
☐ We have a fastener problem and would like to know more about Security Locknuts.
Company Name_____
Address _____
Town _____ Zone____ State_____
Signed _____

Security
The Nut You Can't Shake Loose


LEWIS
LEWIS
LEWIS

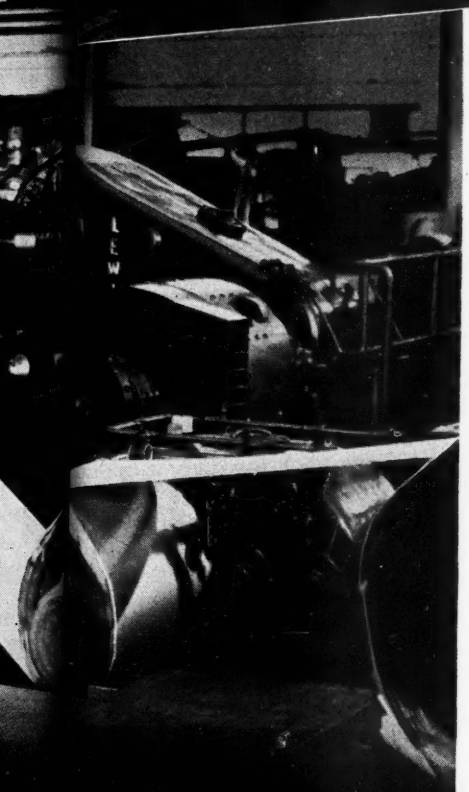
ROLLING MILL EQUIPMENT....

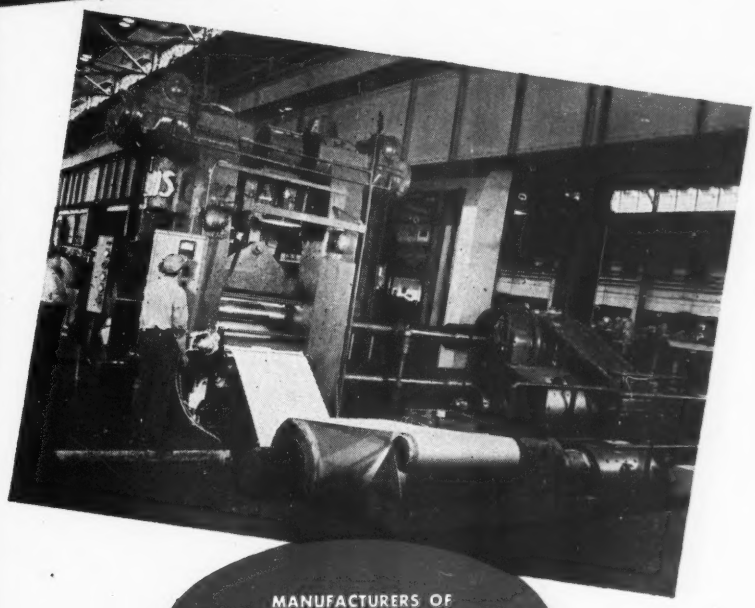
A Lewis 28 x 42 inch two-high skin pass mill at the West Leechburg plant of Allegheny Ludlum Steel Corporation.

This mill will handle stainless steel strip in coils up to 60 inch diameter and 15,000 lb. weight.

The mills are equipped with motorized screw-down, roller bearing rolls, Universal type spindles and motor-operated sled type roll changer.

This installation is typical of rolling mill equipment which Lewis furnishes the iron, steel and non-ferrous industries. Inquiries are always welcomed.





MANUFACTURERS OF
ROLLS AND ROLLING MILL EQUIPMENT
FOR THE IRON, STEEL AND
NON-FERROUS
INDUSTRIES

LEWIS FOUNDRY & MACHINE
DIVISION OF BLAW-KNOX CO., PITTSBURGH, PA.

how Bill Morton grows plants he never sees

He's got a green thumb, no doubt about it. Bill Morton can make sick plants grow strong and sturdy. And when it comes to *industrial* plants—factories—the Bill Mortons of America, taken together, make *them* grow, too.

The lawnmowers, wheelbarrows, trowels, shovels, sprinklers and other assorted items these fellows buy for home and yard maintenance keep many a manufacturer busy the year around. The plants that produce with presses prosper best because Bill individually and collectively, prefers the lighter, smoother, stronger, less costly items that press methods make possible.

If you make metal products, you can't afford to overlook this established public preference, the food that makes factories grow. Let a Clearing engineer show you how to use it to lower your costs and expand your market.

CLEARING MACHINE CORPORATION
6499 WEST 65th STREET • CHICAGO 38, ILL.
HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES

CMC CLEARING

"THE WAY TO EFFICIENT MASS PRODUCTION

eted end. It is made in brass, aluminum, steel, stainless steel and Monel in sizes up to 1-inch OD for jacketing tube.

Electrical Conduit Fittings

USE REPLY CARD—CIRCLE No. 22

Phenolic insulating cable racks made of strong canvas base insulating material are available from Adalet Mfg. Co., Cleveland, O. They are said to have high tensile, flexural and dielectric strength.

Indicating Dynamometer

USE REPLY CARD—CIRCLE No. 23

Model EL traction dynamometer, made by W. C. Dillon & Co. Inc., Forest Park, Ill., will operate electrical warning signals, relays, motors, switches, etc. It can be set for any loading point between 0 and 100,000 pounds. Device works on the principle of deflecting a calibrated beam.

Caster for Trailer-Trucks

USE REPLY CARD—CIRCLE No. 24

Loadmaster industrial caster designed for trailer-truck service is introduced by Midwest Precision Corp., Jackson, Mich. It features a replaceable Timken roller load bearing that permanently eliminates damage to raceways.

Stub Taper Turret Tool Holder

USE REPLY CARD—CIRCLE No. 25

Scully-Jones & Co., Chicago 8, Ill., offers a sleeve type stub taper turret tool holder. It is designed for holding counterbore cutters, countersinks, core drill cutters and similar tools having standard stub taper shanks. Holder is available for Nos. 2, 3 and 4 stub tapers.

Variable Speed Pulley

USE REPLY CARD—CIRCLE No. 26

Operating principle of Var A Cone variable speed pulley permits use of standard A section belt. Telescopic feature of movable disk

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

71. Resistance Welding

Multi-Hydromatic Welding & Mfg. Co.—Available to production and metal fabricating management is 48-page catalog of resistance welding equipment. Illustrated catalog describes units, machines, fixtures and presses along with their specifications and job application. Literature also makes a complete pictorial and literary presentation of company's production facilities.

72. Springtites & Sems

Eaton Mfg. Co., Reliance Div.—Thread and point data contained in 4-page engineering folder S-49A on thread cutting Springtites and Sems covers types used for steel and stainless fastenings, die-castings, light metal parts and plastics.

73. Hydraulic Check Valves

Golden-Anderson Valve Specialty Co.—Application, construction, sizes and pressures details relative to hydraulic double cushioned check valves are included, along with tables showing general dimensions and figure numbers, in bulletin WS-1. Two detailed drawings show complete list of parts.

74. Mill Communication

Farmers Engineering & Mfg. Co.—The Femco Trolleyphone becomes "Your Voice of Action" when installed in mine, mill or other location for communication within your operation. This also is the title of 6-page illustrated bulletin No. 25 which describes the electronic equipment which takes power from trolley wire or power line and utilizes existing wires for transmission. Plug-in model described is compact and easy to install and service.

75. Hydraulic Press History

Hydraulic Press Mfg. Co.—"It Started With an Apple" is intriguing title of 32-page profusely illustrated booklet published to mark company's 75 years of progress. It not only relates the history of the company, but shows typical H-P-M presses for the metal working and process industries, plastic molding industry and die casting. Engineering and manufacturing facilities of both power and press divisions are shown, as well as complete line of components.

76. Sheet & Strip Brass

Bridgeport Brass Co.—A new concept of the importance of grain size in specifying sheet and strip brass is put forth in 4-page folder "Grain Size—The 4th Dimension." Stressing the relation of grain size to physical characteristics of an alloy, folder also illustrates by microphotographs how grain structure is affected by annealing and cold rolling.

77. Protective Coatings

Insul-Mastic Corp. of America—"Insul-Mastic in Industry" is title of 44-page illustrated catalog which describes these Gilsonite base protective coatings, their properties, uses and tests to which they have been subjected. Related products—caulking compounds, primers and membraning material—are also described, as is a cork filling which prevents corrosion and provides insulation.

78. Router Bits

Ekstrom, Carlson & Co.—Descriptions, photographs and prices of Spiral Flute router bits are contained in 4-page bulletin No. SF4. Included are bits with straight or taper shanks, single or double flute, single or double end and with either "up" or "down cut."

79. Arc Welding Equipment

General Electric Co.—Single-phase 60-cycle atomic-hydrogen arc welding equipment is subject of 2-page descriptive bulletin GEC-598A. It explains welding process, describes redesigned power generating equipment, listing specs and advantages, and also covers atomic-hydrogen torch.

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80. Electrical Contacts

Gibson Electric Co.—Properties and uses of Gibson line of electrical contacts described in 12-page illustrated catalog C-520 aid in selection and application throughout the broad original-equipment fields. Contacts made from fine silver, palladium and nickel, silver alloys and many powdered metal compositions are covered and classified according to applications.

81. Porcelain Enamel

Erie Enameling Co.—Sections on types of porcelain enamel, descriptions of various attainable physical characteristics, typical applications and basic rules to be followed in designing for porcelain enamel are found in 16-page booklet "Porcelain Enamel To Handle the 'Tough Jobs'." Another section is devoted to color in industrial porcelain enamel.

82. Hydraulic Presses

Erie Foundry Co.—Intended to illustrate typical presses of various types, 16-page bulletin No. 350 covers multiple opening platen, self-contained forming, mechanical goods, extrusion, molding and controlled type hydraulic presses, as well as those for abrasive molding and die hobbing.

83. Crawler Crane

American Hoist & Derrick Co.—The ¾-yd capacity crawler crane, described and illustrated in 8-page catalog No. 700-G-21, is available with interchangeable fronts for conversion to crane, shovel, dragline or pull shovel. Overall specifications are listed and construction features are shown.

84. Punches & Dies

Federal Machinery Co.—Detailed diagrams, charts, tables and illustrations of typical machinery and equipment in this 32-page Standard Die Catalog facilitate ordering of standard punches and dies for various types of hand, foot and power presses. Prices are shown. Also covered are punch adaptors, die adaptors and die shoes.

85. Oil & Gas Burners

Hauck Mfg. Co.—Oil and gas combustion equipment for production, construction and maintenance applications in industrial plants is reviewed in 12-page illustrated catalog No. 52. Details of various types of equipment available is included. Also offered is 2-page illustrated data sheet No. 715 on high pressure air type oil atomizing inserts for standby oil firing on gas fired furnaces, ovens, kilns, dryers and boilers.

86. Smoke Recorder

Ess Instrument Co.—Plant and combustion engineers interested in recording stack smoke density and combustion performance should get 2-page bulletin 512 on the Ess Smoke Recorder. Wiring and installation diagrams are included.

87. pH Control

Foxboro Co.—Review of pH theory and its practical applications in industrial measurement and control are contained in illustrated bulletin 430-1. Included is a step-by-step explanation of units employed in the pH control cycle. Instrument details, typical process applications and accessory equipment are shown.

EDITORIAL REPRINTS:

88. High-Duty Irons

"High-Duty Irons Reduce Costs" is title of STEEL reprint which relates how high property metals such as Meehanite are bridging the gap between ordinary engineering materials and simplifying fabrication. Author C. E. Herington of Meehanite Metal Corp. describes metal's use in rolls of plate bending machine, die sets, heavy duty fasteners, simplified jig fixtures and tool shanks and bodies.

89. Plastic Dies

Engineers of Chrysler Corp.'s Dodge Truck Div. have picked up a technique of using plastic dies and applied it to a truck draw die operation. More than 10,000 parts have already been produced. Time savings in making dies, lighter weight, and lower costs are advantages. Read about it in STEEL reprint "Plastic Dies Draw Truck Panels," by H. C. Tuttle.

90. Machining Setups

Output of hundreds of machine tools in Kaiser-Frazer's Detroit and Dowagiac, Mich., plants is coordinated to produce 7-cylinder radial engines in quantity. One part, the carrier reduction gear pinion requires 105 machining operations. Read how K-F does it in STEEL reprint "Aircraft Engine Components Machined in Complex Setups."

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eliminates interlocking disk, reduces belt wear and vibration and permits infinitely variable speed changes with 2¾ to 1 ratio. Bushings of the pulley, made by Gerbing Mfg. Corp., Northbrook, Ill., are of oil-impregnated type and require no lubrication. Unit is rated up to ¾-hp at 1750 rpm.

Welding Heads for Blowpipes

USE REPLY CARD—CIRCLE No. 27

Series of 13 welding heads for welding and heating work on practically any metal from 32 gage to more than 1 inch in thickness, is announced by Linde Air Products Co., New York, N. Y. Heads fit interchangeably on Prest-O-Weld W-121 and W-122 welding blowpipes. All heads are snap-in type and are attached to either blowpipe handle by a hand-tightening connection nut.

Hardener Stops Floor Sanding

USE REPLY CARD—CIRCLE No. 28

Flintcrust Liquid is a flush-on preparation that is said to end sanding, dusting and usual breakup of concrete floor that receives rough traffic. Made by Flexrock Co., Philadelphia 4, Pa., it case hardens the surface, sealing and binding the concrete into a tough surface. It also makes it resistant to penetration of acid, grease, oil, water, etc.

Steam Cleaning Compound

USE REPLY CARD—CIRCLE No. 29

Turco 3232, a free rinsing, readily soluble liquid steam cleaning compound that is safe on reactive metals and painted surfaces has been developed by Turco Products Inc., Los Angeles 1, Calif. The nonhazardous nonflammable liquid removes light to medium soil deposits and leaves no white streaks or solution residues on surfaces. It also lubricates check valves, pumps and coils.

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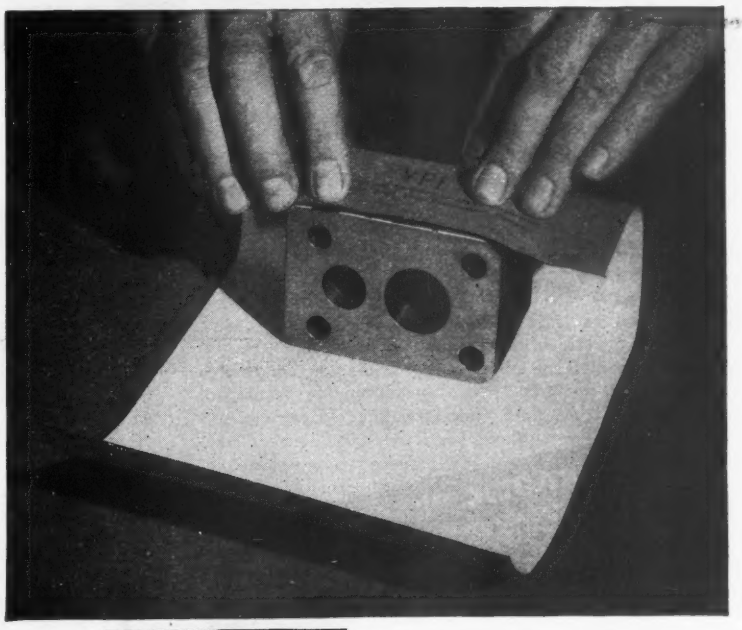
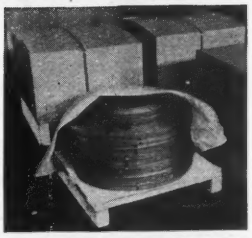
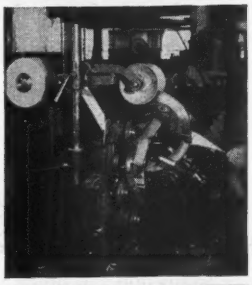
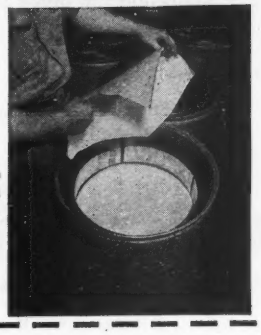




VPI shroud — no oil or goo used.



Angier VPI peripheral wrap



VPI Wrap used as an insert.

Vapor from paper
STOPS RUST

Simple as it seems, this Angier paper is merely placed near metal to *prevent rust*. It gives off a vapor that makes air and moisture harmless to steel.

Angier VPI® Wrap makes coating with oil or goo a needless chore. All "cleaning" costs are saved. Metal stored or shipped with VPI always is ready for instant use . . . what *sales appeal* for your products! Rejects due to rust are eliminated.

If *your* products must be guarded from rust (for days or *years*) send the coupon now for facts.

Angier

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The Most Experienced Name in Vapor Rust Preventives

Angier Corp., Framingham 8, Mass.

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Title .....

(Clip this to your letterhead)

Please send "VPI Facts" as applied to:

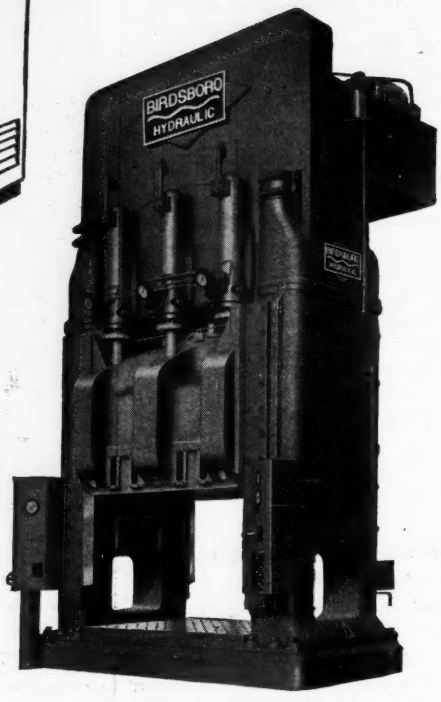
- ☐ Machinery-Industrial, Metal Working, Farm, Office, Construction.
- ☐ Electrical Machinery, Appliances, Products.
- ☐ Transportion Equipment — Auto, Aircraft, Naval, Railroad, etc.
- ☐ Fabricated Products — Cutlery, Hardware, etc.
- ☐ Steel in process of fabrication.
- ☐ Ordnance Equipment.
- ☐ Instruments and clocks.
- ☐ Other.

IN WATER COOLERS

standard models do the job

IN HYDRAULIC PRESSES

it takes a different kind of engineering



To give you the results you want from Hydraulic Presses . . . steady, high output and a new freedom from maintenance headaches . . . it takes a different kind of engineering. It takes engineering that keeps your requirements in mind from the very start of press design . . . through construction of components and assemblies . . . to skilled installation in your plant.

BIRDSBORO ENGINEERING SERVICE

If you feel (like many others) that this kind of engineering service can help to remedy production and profit ailments in your plant, we'd like to talk to you. There's no obligation. Birdsboro Engineering Service starts when and where you want it. First step is to contact Birdsboro's Engineering Department.

BIRDSBORO

STEEL FOUNDRY & MACHINE CO.

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Offering Complete Engineering and Construction Service on:

Steel Mill Machinery • Crushing Machinery • Rolls
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The Market Outlook

MANY steel consumers are in the same position as a Broadway producer of a flop play the morning after the reviews come out. They have tickets, but no takers. Tickets in this case are permits the government issues authorizing consumers to buy a specified amount of steel under the Controlled Materials Plan.

This ticket problem is only a temporary one resulting from the steelworkers' strike. Mills are making good headway in filling the orders accumulated during the work stoppage. As mills get nearer current on deliveries, consumers show increasing interest in buying from the source that will result in the lowest delivered cost. This will do two things: Hurt the premium price sellers, and cause consumers to buy close to home.

CAPABLE— Of all steel products none is in any tighter supply than bars, particularly those over an inch in cross section. Frequently it's said that the country needs more hot-rolled bar capacity. But do we? In 1945 when the American Iron & Steel Institute reported steel finishing capacities on a maximum annual potential basis, without relation to available supply of ingots or to actual performance, it showed that this country's hot-rolled bar capacity was 22.7 million net tons. The consensus is that hot-rolled bar capacity is about the same as it was in 1945. Production in 1951 was only half that amount, 10.8 million tons. That there is capacity not now being utilized fully is borne out by reports that some bar mills are operating only a part of each week. If that is because they lack steel, they should get some relief in the expansion of the country's ingot capacity.

CONCENTRATED— Some of the difficulty of filling the bar demand stems from the concentration of the military demand in a certain range of sizes.

More steel might go into bars if that were a more profitable product. But even so, the steel industry is channeling an increasing percentage of steel into the bar mills. In the first half of 1952, hot-rolled bars comprised 14.5 per cent of all mill shipments of finished steel. For all of 1951 the rate was 13.7 per cent. In 1950 it was 13.4 per cent.

UP FOR STUDY— The bar shortage will be considered again when the Carbon Bar and Semi-finished Steel Industry Advisory Committee meets with the NPA in Washington next Wednesday.

Now that we're farther away from the steel strike, sheets are again showing signs of easing in supply. There are isolated instances of immediate availability, but they're at mills the least favorably located as to consuming areas. Outlook for the first quarter of 1953 is brighter than any for some time. It's possible that some tonnage will crop up in January and February now that carryovers for the fourth quarter look like they'll be cleared away in less than the allotted first two months of 1953.

TIGHT SPOT— Heavy plates continue in tight supply but there is belief there may be some easing by the second quarter of 1953.

Wire mills are catching up ahead of others. While some first-quarter wire orders have been booked where consumers have tickets, pressure beyond fourth quarter is only moderate.

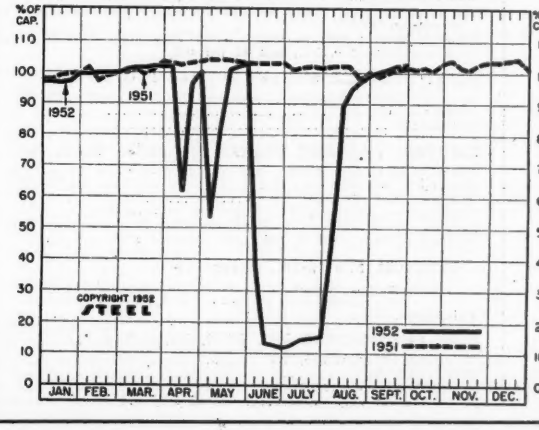
Pipe looms as one of the toughest supply problems of next year. Seamless will be in critical supply, buttweld a little less so.

BETTER SHAPE— Structural shapes have moved into better position, with some producers booking deliveries for January and February on fourth-quarter rated orders, while knocking out back work at a rapid clip. There's a fair amount of inquiries, but new work isn't coming in to fabricators as fast as deliveries are made.

Demand for bolts and nuts continues strong.

STEADY RECOVERY— Since the end of the strike the rise in steelmaking operations has been steady. In the week ended Sept. 27 it reached 102.5 per cent of capacity and was equivalent to production of approximately 2,129,000 net tons of steel for ingots and castings.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Sept. 27	Change	Same Week 1951	Same Week 1950
Pittsburgh	101	+ 1.5*	99.5	101
Chicago	106	+ 1	105	103
Mid-Atlantic	98	0	100	99
Youngstown	106	+ 1	108	106
Wheeling	97.5	— 0.5	96.5	98
Cleveland	107	— 0.5*	97	100
Buffalo	104.5	0	104	104
Birmingham	101	+ 1	102	100
New England	85	+ 3	93	82
Cincinnati	95	+ 1	103	103
St. Louis	106.5	+ 5.5	86.5	92
Detroit	106	+ 6*	103.5	106
Western	102	— 1	102	105
Estimated national rate	102.5	+ 0.5	101.5	101

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,271 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 39 Production-Engineering News—p. 75

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics	Sept. 23, 1952	Sept. 16, 1952	Month Ago	August Average
(1947-1949)=100	130.7	130.8	130.8	130.8

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Sept. 23, 1952

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.650	Sheets, galv.	6.995
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft).	8.997
Structural shapes	4.200	Boiler tubes (100 ft)	31.360
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.149	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire, fence, galv.	6.475
Bars, reinforcing	4.050	Nails (100 lb keg)	7.380
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spool)	5.960
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.810

	Sept. 25 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL PRICE INDEX, Weighted: Calculated by STEEL*					
Index (1935-39 av.=100)	181.40	181.40	181.40	171.92	128.96
Index in cents per lb.	4.914	4.914	4.914	4.657	3.494
ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*					
Finished Steel, NT	$111.66	$111.66	$111.66	$106.32	$75.41
No. 2 Fdry, Pig Iron, GT	55.04	55.04	55.04	52.54	36.59
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	36.13
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	37.13
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	37.83

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Sept. 25 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.223	3.28
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del., Philadelphia	4.13	4.13	4.13	3.918	2.94
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60–75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Nails, Wire, Pittsburgh	5.90-6.35	5.90-6.35	5.90-6.35	5.90-6.20	4.25
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$5.75
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, 5/32-⅝", Pitts.	4.325	4.325	4.325	4.10–30	2.925
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Phila.	59.25	59.25	59.25	56.61	38.72
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.11	39.22
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	34.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	38.25
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	44.00
Ferromanganese, Etna, Pa.	228.00	228.00	228.00	188.00	140.25*

F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$44.00	$44.00	$44.00	$45.00	$38.00
No. 1 Heavy Melt, E. Pa.	41.50	41.50	41.50	43.50	36.75
No. 1 Heavy Melt, Chicago	42.50	42.50	42.50	43.50	38.75
No. 1 Heavy Melt, Valley	44.00	44.00	44.00	45.00	40.00
No. 1 Heavy Melt, Cleve.	43.00	43.00	43.00	44.00	38.25
No. 1 Heavy Melt, Buffalo	43.00	43.00	43.00	44.00	39.50
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	46.25
No. 1 Cast, Chicago	50.00	50.00	50.00	49.00†	43.50

* Nominal. † F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$11.50-12.50
Beehive, Fdry, Connlsvl.	17.00	17.00	17.00	17.50	14.00-15.00
Oven Fdry, Chicago	23.00	23.00	23.00	23.00	17.50

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward, Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda, N.Y. W12	54.50	55.00	55.50	....
No. Tonawanda, N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester, N.Y. del.	57.52	58.02	58.52	....
Syracuse, N.Y. del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50	....	55.00	....
IndianaHarbor, Ind. I-2	54.50	....	55.00	....
So. Chicago, Ill. W14	54.50	55.00	55.00	....
So. Chicago, Ill. Y1	54.50	55.00	55.00	....
So. Chicago, Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich. del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	60.50	61.00	....	....
GraniteCity, Ill. G4	56.40	56.90	57.40	....
St. Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton, Utah C11	54.50	55.00	....	....
Geneva, Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa, Colo. C10	56.50	57.50	57.50	....
Rockwood, Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead,				
Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer, Pa. U5	54.50	....	55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50	....	....	....
McKeesport, Pa. N3	54.50	....	....	55.50
Monessen, Pa. P7	56.50	....	....	....
Sharpsville, Pa. S6	....	....	55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

* Low phos, southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion therof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia delivered	66.05
Troy, N.Y. R2	62.50

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Sept. 25, 1952; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa. U5 .....54.00
Seattle S24 .....73.00
INGOTS, Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....57.00
Seattle S24 .....80.00
BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 .....$59.00
Clairton,Pa. U5 .....59.00
Ensley,Ala. T2 .....59.00
Fairfield,Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 .....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
So.Duquesne,Pa. U5 ...59.00
Carbon, Forging (NT)
Bessemer,Pa. U5 .....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....74.00
Johnstown,Pa. B2 .....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3 .....89.50
So.Chicago R2,U5,W14..70.50
So.Duquesne,Pa. U5 ...70.50
So.SanFrancisco B3 ...89.50
Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton,O. R2 .....76.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 .....76.00
Lackawanna,N.Y. B2 ..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....76.00
So.Chicago R2,U5,W14..76.00
So.Duquesne,Pa. U5 ...76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00
ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R2 .....87.50
So.Chicago,Ill. R2 ....87.50
So.Duquesne,Pa. U5 ...87.50
SHEET BARS (NT)
Fontana,Calif. K1(43) .$89.00
SKELP
Aliquippa,Pa. J5 .....$3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ....3.55
WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2 ..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ...4.975
Portsmouth,O. P12 ....4.525
Roebling,N.J. R5 .....4.425
So.Chicago,Ill. R2 .....4.325
SparrowsPoint,Md. B2..4.425
Sterling,Ill.(1) N15 ....4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ...5.125
Worcester,Mass. A7 ...4.625
SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.675
Lackawanna,N.Y. B2 ...4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.45
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ....4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 .....4.56
Phoenixville,Pa. P4 .....6.10
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14.3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 .....4.10
Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....4.85
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ...3.90
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 ....3.85
Alloy Stand. Shapes
Clairton,Pa. U5 .....4.725
Fontana,Calif. K1 .....5.925
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala. T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala. T2 .....5.80
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind. Y1 .....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill. U5 .....5.80
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.30
H.S., L.A. Wide Flange
Aliquippa,Pa. J5 .....5.50
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75
BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 .....3.85
PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ...6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ..6.55
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 .....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2 ..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95
PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ..5.55
Fontana,Calif. K1 .....6.20
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2 ..5.25
FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ...4.95
Ind.Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago,Ill. U5 .....4.95
PLATES, Ingot Iron
Ashland,c.l. (15) A10...4.15
Cleveland,c.l. R2 .....4.50
Warren,O.,o.l. R2 .....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10...3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 .....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich. G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1 ..4.50
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 .....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 .....6.50
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14.3.90
SparrowsPoint,Md. B2 ..3.90
Steubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1.3.90
PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.65
Geneva,Utah C11 .....5.05
PLATES, Wrought Iron
Economy,Pa. B14 .....8.60
BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ...3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ...3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11.3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Seattle B3, N14 .....4.70
So.Chicago R2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ....3.95
So.SanFran.,Cal. B3 ....4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Weirton,W.Va. W6 .....4.10
Youngstown R2, U5 ....3.95
BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta A11 .....4.50
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.00
BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....4.15
BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.675
Buffalo R2 .....4.675
Canton,O. R2 .....4.675
Canton,O. T7 .....4.72
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 .....5.725
Gary,Ind. U5 .....4.675
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.675
Johnstown,Pa. B2 .....4.675
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ...4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14. 4.675
So.Duquesne,Pa. U5 ....4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675
BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 .....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich. G5 .....6.675
Fairfield,Ala. T2 .....5.925
Fontana,Calif. K1 .....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ....5.925
IndianaHarbor,Ind. Y1 .6.425
Johnstown,Pa. B2 .....5.925
Lackawanna,N.Y. B2 ...5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ....5.925
So.SanFrancisco B3 ....6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925
BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.925
BeaverFalls,Pa. R2 ....4.925
BeaverFalls,Pa. M12 ...4.55
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.55
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 .....4.925
Detroit P17, R7.....5.075
Donora,Pa. A7 .....4.925
Elyria,O. W8 .....4.925
FranklinPark,Ill. N5 ....4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. F7 .....4.925
Hammond,Ind. L2,M13.4.925
Hartford,Conn. R2 ....5.475
Mansfield,Mass. B5 ....5.475
Massillon,O. R2, R8....4.925
Monaca,Pa. S17 .....4.925
Newark,N.J., W18 .....5.375
Plymouth,Mich. P5 ....5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 .....5.475
Readville,Mass. C14 ....5.475
St. Louis,Mo. M5 .....5.30
So.Chicago,Ill. W14 ....4.925
SpringCity,Pa. K3 .....5.375
Struthers,O. Y1 .....4.925
Waukegan,Ill. A7 .....4.925
Youngstown Y1 .....4.925
Youngstown F3 .....4.925
BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.00
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....6.00
Buffalo B5 .....6.00
Camden,N.J. P13 .....6.40
Canton,O. R2 .....6.00
Canton,O. T7 .....5.99
Carnegie,Pa. C12 .....5.40
Chicago B5 .....6.00
Chicago W18 .....6.00
Cleveland A7 .....6.05
Cleveland C20 .....6.00
Detroit P17, R7 .....6.15
Donora,Pa. A7 .....6.05
Elyria,O. W8 .....6.00
Gary,Ind. R2 .....6.00
Hammond,Ind. L2, M13.6.00
Hartford,Conn. R2 .....6.45
Lackawanna,N.Y. B2 ...6.90
Mansfield,Mass. B5 ....6.45
Massillon,O. R2, R8....6.00
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....6.00
Newark,N.J. W18 .....6.35
Plymouth,Mich. P5 .....6.20
So.Chicago,Ill. R2, W14.6.00
SpringCity,Pa. K3 .....6.20
Struthers,O. Y1 .....6.00
Warren,O. C17 .....6.00
Waukegan,Ill. A7 .....6.05
Worcester,Mass. A7 ....6.35
Youngstown Y1 .....6.00
Youngstown F3 .....6.00
BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.95
Atlanta A11 .....4.50
Buffalo R2 .....3.95
Cleveland R2 .....3.95
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ...3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.65
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
SandSprings,Okla. S5 ....4.60
Seattle B3, N14 .....4.70
So.Chicago,Ill. R2 .....3.95
So.Duquesne,Pa. U5 ....3.95
So.SanFrancisco B3 ....4.70
SparrowsPoint,Md. B2 ..3.95
Sterling,Ill.(1) N15 ....4.70
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Youngstown R2, U5 ....3.95
BARS, Reinforcing (Fabricated; to Consumers)
Huntington,W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ...4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.25
Seattle B3, N14 .....5.50
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ...4.75
Williamsport,Pa. S19 ...5.10
RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4 5.10
Huntngt,W.Va.(3) W7 ..5.75
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....4.05
Tonawanda(3,4) B12 ...5.00
Williamsport(3) S19 ....5.25
Williamsport(4) S19 ....5.35
BARS, Wrought Iron
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5. 14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00
SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.775
Ashland,Ky.(8) A10 ...3.775
Butler,Pa. A10 .....3.775
Cleveland J5, R2 .....3.775
Conshohocken,Pa. A3...4.175
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.975
Fairfield,Ala. T2 .....3.775
Fontana,Calif. K1 .....4.725
Gary,Ind. U5 .....3.775
Geneva,Utah C11 .....3.875
GraniteCity,Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.775
Irvin,Pa. U5 .....3.775
Lackawanna,N.Y. B2 ..3.775
Munhall,Pa. U5 .....3.775
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ....4.475
Pittsburgh J5 .....3.775
Sharon,Pa. S3 .....4.175
So.Chicago,Ill. W14 ...3.775
SparrowsPoint,Md. B2..3.775
Steubenville,O. W10 ...3.775
Torrance,Calif. C11 ....4.475
Warren,O. R2 .....3.775
Weirton,W.Va. W6 ....3.775
Youngstown U5, Y1 ...3.775
SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.925
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.675
Torrance,Calif. C11 ...5.575
SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.675
Conshohocken,Pa. A3 ..5.925
Ecorse,Mich. G5 .....6.225
Fairfield,Ala. T2 .....5.675
Fontana,Calif. K1 .....6.625
Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 ....5.675
Ind.Harbor,Ind. Y1 .....6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ....5.675
Munhall U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 ....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 ....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175
SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.925
Ecorse,Mich. G5 .....7.475
Fontana,Calif. K1 .....7.875
Gary,Ind. U5 .....6.925
IndianaHarbor,Ind. Y1.7.425
IndianaHarbor,Ind. I-2.6.925
Irvin,Pa. U5 .....6.925
Lackawanna(37) B2 ....6.925
Pittsburgh J5 .....6.925
SparrowsPoint(38) B2..6.925
Warren,O. R2 .....6.925
Weirton,W.Va. W6 ....7.275
Youngstown Y1 .....7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.575
GraniteCity,Ill. G4	5.275
Ind.Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	4.575
Youngstown Y1	4.575

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Delphos,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
MartinsFerry,O. W10	5.075
Niles,O. N12	*6.275*
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	*6.825*

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1 (43)	5.10
Torrance,Calif. C11	5.275

BLUED Stock, 29 ga.

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
GraniteCity,Ill. G4	5.625
Ind.Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	*6.30*
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.35

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	....
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind.Harbor I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	....
MartinsFy.,O.W10	5.875	...
Pittsburg,Cal. C11	6.625	....
SparrowsPt. B2	5.875	....
Torrance,Cal.C11	6.625	....

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind.Harbor,Ind. I-2	4.025
Warren,O. R2	4.375

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.075
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TINPLATE, American 1.25 lb Coke (Base Box)

Aliquippa,Pa. J5	$8.70
Fairfield,Ala. T2	8.80
Gary,Ind. U5	8.70
Ind.Har. I-2, Y1	8.70
Irvin,Pa. U5	8.70
Pitts.,Cal. C11	9.45
Sp.Pt.,Md. B2	8.80
Warren,O. R2	8.70
Weirton,W.Va.W6	8.70
Yorkville,O. W10	8.70

TINPLATE, American 1.50 lb

$8.95	
9.05	
8.95	
8.95	
8.95	
9.70	
9.05	
...	
9.90	
8.95	

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.65

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	*6.275*
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind.Harb.,Ind. I-2	5.65
Ind.Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	*5.70*
LosAngeles(25) B3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So.SanFrancisco(25) B3	6.40
Sparrow Point,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L1	4.20
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.275
Bessemer,Ala. T2	3.725
Bridgeprt,Conn.(10)S15	4.225
Buffalo(27) R2	3.725
Butler,Pa. A10	3.725
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.10
Lackaw'na,N.Y.(32) B2	3.725
LosAngeles(25) B3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	6.05
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.30
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40)T6	5.35
Ind.Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	*6.85*
Mattapan,Mass. T6	5.95

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	*7.65*	*8.25*	*10.20*	*12.50*
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	...	....
Detroit D2	6.45	7.50	8.10	...	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20	...	....
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base.	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	*7.65*	*8.25*	*10.20*	*12.50*
Spring Steel (Tempered)					
Trenton,N.J. R5 (29)	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	*10.30*	*12.50*	*15.35*

* Plus $1.575 per 100 lb.

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	*7.05*	*7.35*	*7.85*	...	...
Vandergrift,Pa. U5	...	7.85	8.35	9.60	10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	..	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet.
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H.K. Porter Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Ingot Iron

Middletown,O. A10	5.10
NewBritain(10) S15	5.80
New Castle,Pa. B4	5.80
NewCastle,Pa.(40) E5	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. R3	6.45
Pawtucket,R.I.(21) N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40) T5	5.25
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40)	*5.70*
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	5.10
Youngstown C8	*5.70*

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	12.15
Carnegie,Pa. S18	10.60
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn.Conn.(10)S15	12.15
Pawtucket,R.I.(11) N8	12.15
Pawtucket,R.I.(12) N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	*12.00*

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.70

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Riverdale,Ill. A1	4.30
Sharon,Pa. S3	4.55
Youngstown U5	4.15

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2	.6.075	6.325
Aliquippa J5	....6.075	6.45*
Atlanta A11	.....6.325	6.675
Bartonville(19) K4	6.075	6.45
Buffalo W12	..... *5.225*	
Cleveland A7	....6.075	6.225
Crawfordsville M8	6.175	6.55
Donora,Pa. A7	..6.075	6.225
Duluth,Minn. A7	.6.075	6.225
Fairfield T2	....6.075	6.225
Houston,Tex. S5	.. 6.10	6.55
Johnstown B2	.. 6.075	6.45†
Joliet,Ill. A7	....6.075	6.225
KansasCy,Mo. S5	. 6.30	6.75
Kokomo C16	.... 6.175	6.425
LosAngeles B3	.. 7.025	....
Minnequa C10	... 6.325	6.70*
Monessen P7	.... 5.95	6.40
Palmer W12	..... *5.525*	....
Pitts.,Calif. C11	..7.025	7.175
Prtsmth.(18)P12.	6.475	....
Rankin A7	.....6.075	6.225
So.Chicago R2	....6.075	6.325
So.S.Fran. C10	.. 7.025	7.40*
SparrowsPt. B2	. 6.175	6.55†
Sterling,Ill.(1)N15	6.075	6.45
Struthers,O. Y1..	6.075	6.475
Torrance,Cal. C11	7.025	....
Worcester A7	...6.375	6.525

*Based on 14-cent zinc; †14.50-cent zinc.

ROPE WIRE (A)

Alton,Ill. L1	.9.15
Bartonville,Ill. K4	.8.95
Buffalo W12 (43)	.8.55
Fostoria,O. S1 (43)	.8.85
Johnstown,Pa. B2 (43)	.8.55
Monessen,Pa. P16 (43)	.8.55
Monessen,Pa. P7 (43)	.8.80
Muncie,Ind. I-7 (43)	.8.75
Palmer,Mass. W12 (43)	.8.85
Portsmouth,O. P12 (43)	.8.55
Roebling,N.J. R5 (43)	.8.85
SparrowsPt. B2 (43)	...8.65
Struthers,O. Y1 (43)	...8.55
Worcester J4, T6 (43)	..8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	..5.225
Aliquippa,Pa. J5 (42)	..4.85
Atlanta A11	.....5.475
Alton,Ill. L1	.....5.45
Bartonville,Ill. K4	.....5.325
Buffalo W12	.....*5.225*
Chicago W13	.....5.475
Cleveland A7, C20	.....5.225
Crawfordsville,Ind. M8	.5.325
Donora,Pa. A7	.....5.225
Duluth,Minn. A7	.....5.225
Fairfield,Ala. T2	.....5.225
Fostoria,O.(24) S1	....5.725
Houston S5	.....5.25
Johnstown,Pa. B2	.....5.225
Joliet,Ill. A7	.....5.225
KansasCity,Mo. S5	.....5.45
Kokomo,Ind. C16	.....5.325
LosAngeles B3	.....6.175
Minnequa,Colo. C10	...5.475
Monessen,Pa. P7	.....5.10
Newark 6-8 ga. I-1	....5.88
No.Tonawanda B11	....5.225
Palmer,Mass. W12	.....*5.525*
Pittsburg,Calif. C11	...6.175
Portsmouth,O. P12	....5.625
Rankin,Pa. A7	.....5.225
So.Chicago,Ill. R2	....5.225
So.SanFrancisco C10	..6.175
SparrowsPoint,Md. B2	..5.325
Sterling,Ill.(1) N15	...5.225
Struthers,O. Y1	.....5.225
Torrance,Calif. C11	....6.175
Waukegan,Ill. A7	.....5.225
Worcester,Mass. A7	...5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	.....6.20
Buffalo W12 (43)	.....*6.35*
Cleveland A7 (43)	.....5.85
Crawf'sville,Ind. M8(43)	5.85
Dover,O. G6	.....6.20
Fostoria,O. S1 (43)	.....6.00
Kokomo,Ind. C16 (43)	..5.70
FranklinPark,Ill. T6(43)	.6.20
Massillon,O. R8 (43)	....5.85
Monessen,Pa. P16 (43)	..6.35
Monessen,Pa. P7	.....6.10
Pawtkt,R.I.(12) N8 (43)	6.85
Trenton,N.J. R5 (43)	...6.15
Worcester,Mass. A7(43)	.6.15
Worcester.Mass. T6(43)	.6.50
Worcester,Mass. W12 (43)	*6.65*

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	.....8.90
Monessen,Pa. P16 (43)	..8.50
Muncie,Ind. I-7 (43)	....8.70
Roebling,N.J. R5 (43)	...8.80
SparrowsPt.,Md. B2 (43)	8.60
Johnstown,Pa. B2 (43)	..8.50

WIRE (16 gage)	**Anl'd. Stone**	**Galv.**
(Add 4.7% on base and extras)		
Aliquippa J5	....10.15	12.15
Bartonville(19) K4	10.25	12.00*
Cleveland A7	....10.25	11.55
Crawfrdsville M8	10.25	12.00
Fostoria.O. S1	...10.40	13.00
Johnstown B2	..10.73	12.58§
Kokomo C16	10.625†	12.325†
Minnequa C10	..10.40	12.425*
Palmer,Mass. W12.	10.25	12.15
Pitts.,Cal. C11	...10.60	11.90
SparrowsPt. B2	..10.84	12.68§
Waukegan A7	....10.25	11.55
Worcester A7	.....	11.85

*Based on 14-cent; §14.50 cent zinc. †Includes 4.7% increase.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	..6.25
Alton,Ill. L1	.....6.85
Bartonville,Ill. K4	.....6.64
Buffalo W12 (43)	.....*6.25*
Cleveland A7 (43)	.....6.25
Donora,Pa. A7 (43)	.....6.25
Duluth,Minn. A7 (43)	..6.25
Fostoria,O. S1 (43)	..6.25
Johnstown,Pa. B2 (43)	..6.25
Millbury(12) N6 (43)	...8.05
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	...6.25
Monessen,Pa. P16	.....*6.75*
Muncie,Ind. I-7 (43)	....6.45
Palmer,Mass. W12 (43)	*6.55*
Pittsburg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	...6.55
Portsmouth,O. P12(43)	..6.25
So.Chicago,Ill. R2 (43)	..6.25
So.SanFran. C10 (43)	..7.20
SparrowsPt.,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	....6.25
Trenton,N.J. A7 (43)	...6.55
Waukegan,Ill. A7 (43)	..6.25
Worcester A7, T6 (43)	.6.55
Worcester,Mass. W12(43)	*6.55*
Worcester,Mass. J4(43)	*6.75*

WIRE, Tire Bead

Bartonville,Ill. K4	.....11.51
Monessen,Pa. P16 (43)	.11.40
Roebling,N.J. R5 (43)	..11.55

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill. K4	.....9.42
Buffalo W12 (43)	.....*8.90*
Chicago W13	.....9.32
Cleveland A7 (43)	....8.90
Crawf'sville,Ind. M8(43)	8.90
Fostoria,O. S1 (43)	....8.90
Johnstown,Pa. B2 (43)	..8.90
Kokomo,Ind. C16 (43)	...8.90
Monessen,Pa. P16 (43)	..8.90
Muncie,Ind. I-7 (43)	....9.10
Palmer,Mass. W12 (43)	*9.20*
Roebling,N.J. R5 (43)	....9.20
Waukegan,Ill. A7 (43)	..8.90
Worcstr,Mass. A7,T6(43)	9.20

WIRE, Barbed Col.

AlabamaCity,Ala. R2	...144
Aliquippa,Pa. J5	.....*147**
Atlanta A11	149
Bartonville,Ill.(19) K4	...147
Crawfordsville,Ind. M8	.149
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	149
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	153
Kokomo,Ind. C16	149
Minnequa,Colo. C10	....153*
Monessen,Pa. P7	146
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10.	.167*
SparrowsPoint,Md. B2	..149
Sterling,Ill.(1) N15	147

*Based on 14-cent zinc

WIRE, Upholstery Spring

Aliquippa,Pa. J5	.....6.275
Alton,Ill. L1	.....6.50
Buffalo W12	.....*6.275*
Cleveland A7	.....6.275
Donora,Pa. A7	.....6.275
Duluth,Minn. A7	.....6.275
Johnstown,Pa. B2	.....6.275
Los Angeles B3	.....7.225
Minnequa,Colo. C10	...6.525
Monessen,Pa. P7	.....5.90
Monessen,Pa. P16(42)	..6.40
NewHaven,Conn. A7	...6.575
Palmer,Mass. W12	.....*6.575*
Pittsburg,Calif. C11	...7.225
Portsmouth,O. P12	....6.275
Roebling,N.J. R5	.....6.575
So.Chicago,Ill. R2	....6.275
So.SanFrancisco C10	...7.225
SparrowsPoint,Md. B2.	6.375
Torrance,Calif. C11	...7.225
Trenton,N.J. A7	.....6.575
Waukegan,Ill. A7	.....6.275
Worcester,Mass. A7	.....6.575

WOVEN FENCE,9-15½ Ga. Col.

AlabamaCity,Ala. R2	...135
Ala.City,Ala.,17-18ga.R2.	.222
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	140
Bartonville,Ill.(19) K4	..138
Crawfordsville,Ind. M8	..140
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	139
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	.229
Joliet,Ill. A7	133
KansasCity,Mo. S5	143
Kokomo,Ind. C16	140
Minnequa,Colo. C10	....146*
Monessen,Pa. P7	136
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill.(1) N15	138

*Based on 14-cent zinc

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill.(19) K4	...132
Crawfordsville,Ind. M8	..134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	135
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	..156
SparrowsPoint,Md. B2	..134
Sterling,Ill.(1) N15	132

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	133
Franklin,Pa. F5	140
Huntington,W.Va. W7	...148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	...148
Williamsport,Pa. S19	...158

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	.....9.85
Lebanon,Pa.(31) B2	....9.85
Minnequa,Colo. C10	....9.85
Pittsburgh O3, P14	....9.85

AXLES

Ind.Harbor,Ind. S13	.....5.65
Johnstown,Pa. B2	.....5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 (44)	118
Aliquippa,Pa. J5 (44)	118
Atlanta A11	130
Bartonville,Ill.(19) K4	..127
Chicago,Ill. W13 (44)	118
Cleveland A9 (44)	.....*125*
Crawfordsville,Ind. M8	..130
Donora,Pa. A7 (44)	118
Duluth,Minn. A7 (44)	118
Fairfield,Ala. T2 (44)	118
Galveston,Tex. D7(44)	126
Houston,Tex. S5	126
Johnstown,Pa. B2 (44)	118
Joliet,Ill. A7 (44)	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	..123
Monessen,Pa. P7	124
Pittsburg,Calif. C11 (44)	..137
Portsmouth,O. P12	132
Rankin,Pa. A7 (44)	118
So.Chicago,Ill. R2 (44)	..118
SparrowsPoint,Md.B2(44)	120
Sterling,Ill.(1) N15	127
Torrance,Calif. C11 (44)	..138
Worcester,Mass. A7 (44)	..124

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 (44)	118
Atlanta A11	129
Bartonville,Ill. (19) K4.	.127
Chicago W13	127
Crawfordsville,Ind. M8	..128
Donora,Pa. A7 (45)	118
Duluth,Minn. A7 (45)	..118
Fairfield,Ala. T2 (45)	118
Johnstown,Pa. B2 (45)	..118
Joliet,Ill. A7 (45)	118
Kokomo,Ind. C16	128
Minnequa,Colo. C10 (45)	.123
Pittsburg,Calif. C11 (45)	.137
Portsmouth,O. P12	132
Rankin,Pa. A7 (45)	118
SparrowsPoint,Md.B2(45)	120
Sterling,Ill.(1) N15	126
Torrance,Calif. C11 (45)	..138
Worcester,Mass. A7 (45)	.124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	..$7.80
Wheeling,W.Va. W10	...7.80

TIE PLATES

Fairfield,Ala. T2	.....4.775
Gary,Ind. U5	.....4.775
Ind.Harbor,Ind. I-2	....4.775
Lackawanna,N.Y. B2	..4.775
Minnequa,Colo. C10.	.$95.50*
Pittsburg,Calif. C11	...4.925
Seattle B3	.....4.925
Steelton,Pa. B2	.....4.775
Torrance,Calif. C11	....4.925

*Per net ton.

JOINT BARS

Bessemer,Pa. U5	.....4.925
Fairfield,Ala. T2	.....4.925
Ind.Harbor,Ind. I-2	....4.925
Joliet,Ill. U5	.....4.925
Lackawanna,N.Y. B2	..4.925
Minnequa,Colo. C10	...4.925
Steelton,Pa. B2	.....4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	.....6.40
Lebanon,Pa. B2	.....6.65
Minnequa,Colo. C10	....6.65
Pittsburgh J5	.....6.65
Seattle B3	.....7.15
So.Chicago,Ill. R2	.....6.65
Struthers,O. Y1	.....6.65
Youngstown R2	.....6.65

RAILS	Std. No. 1	Std. No. 2	Std. No. 2 All	Std. Toe Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675	...	4.25
Fairfield,Ala. T2	...	...	...	4.25
Gary,Ind. U5	3.775	3.675	3.725	...
Huntington,W.Va. W7	....	....	....	5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	...
Johnstown,Pa. B2	...	...	...(16)	4.25
Lackawanna,N.Y. B2	3.775	3.675	...	4.25
Minnequa,Colo. C10	$75.50*	$73.50*	...	4.75
Steelton,Pa. B2	3.775	3.675	...	...
Williamsport,Pa. S19	...	...	...	5.00

* Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.35c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

controlled atmosphere

GAS FIRED FURNACES

make glass-to-metal bond

at A. O. SMITH CORPORATION
KANKAKEE, ILLINOIS

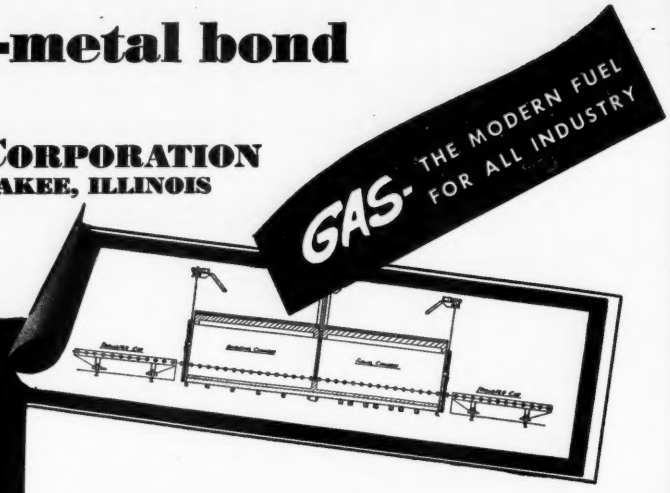


Diagram of Gas-fired glass-coating furnaces at A. O. Smith Corporation, used to fire glass-lined water heaters and Harvestore sheets. Capacity of one furnace is 1,182 cu. ft. At left: Load enters furnace.

Gas-Firing for dependable glass-to-metal bonding is accomplished under controlled atmosphere conditions at A. O. Smith Corporation's plant in Kankakee, Illinois. Three furnaces like the one shown are utilized. Each furnace has two zones. First zone, at 1050° F. is for pre-heat, controlled oxidation, and the second controlled atmosphere zone fires at 1600° F. Each zone is fired by 16 Gas burners, eight to a side through heat resistant alloy "radiant" tubes. All Gas-firing is under precise automatic control, to get exact temperatures needed for processing.

Process Heating with GAS is used at A. O. Smith in a variety of ways, too.

1. **Gas-fired immersion coils in liquid baths**
2. **Submerged Gas burners in pickle liquor tanks**
3. **Direct Gas-fired burners for heating zinc, hot-dipped, galvanized**

Typical uses include spray washer baths to clean steel, Bonderizing process before painting, galvanizing process for cleaning, pickling and rinsing. The fuel savings with GAS paid for installed Gas Equipment the first year!

Whatever your production line problems, Modern Industrial Gas Equipment can be designed to integrate readily with your production techniques. Gas is the Modern Fuel for All Industry, because Gas is efficient, economical, versatile. Gas can be controlled automatically and precisely, to meet the most exacting processes. Get the facts today from your Gas Company Representative.

AMERICAN GAS ASSOCIATION • 420 LEXINGTON AVENUE • NEW YORK 17, N.Y.

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E*	F
⅛	5.5c	0.24	30.5	28.5	...	1.25	+6.25	....
¼	6.0	0.42	25	23	...	+1.75	+9.25	....
⅜	6.0	0.57	20	18	...	+5.5	+15.75	....
½	8.5	0.85	32.5	30.5	31.5	13.25	6.25	12.25
¾	11.5	1.13	35.5	33.5	34.5	17.25	10.25	16.25
1	17.0	1.68	38	36	37	20.75	13.75	19.75
1¼	23.0	2.28	38.5	36.5	37.5	20.5	14.75	19.5
1½	27.5	2.73	39	37	38	21.5	15.75	20.5
2	37	3.68	39.5	37.5	38.5	22	16.25	21
2½	58.5	5.82	40	38	39	21.75	17.25	20.75
3	76.5	7.62	40	38	39	21.75	17.25	20.75

*Based on 19.50-cent zinc.

Column A: Etna, Pa. N2 and 33% on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1 point lower on ⅛", 1¾ points lower on ¼", and 2¼ points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜".

Following make ½" and larger: Lorain, O. N3; Youngstown R2 and 33% on 3½" and 4"; Youngstown Y1. Fontana, Calif. K1 quotes 11½ points lower on ⅛" and larger continuous weld and 20.5% on 3½" and 4".

Column B: Sparrows Point, Md. B2; Wheatland, Pa. 2 points higher on ⅛" through 3" W9.

Column C: Indiana Harbor, Ind., Y1; Alton, Ill., 2 points lower L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus ¼% on ⅛" plus 3½% on ¼", plus 7¾% on ⅜" and 14¼% on 3½", 4".

Etna, Pa. N2 and 14¼% on 3½", 4". Following quote only on ⅛" and larger: Lorain, O. N3; Youngstown R2, and 14¼% on 3½" and 4"; Youngstown Y1; Fontana, Calif. K1 quotes 11½ points lower.

Column E: Sparrows Point, Md. B2.

Column F: Indiana Harbor, Ind. Y1; Alton, Ill. 1¾ points lower on ½", ¾" and 1", 1 point lower on 1¼", 1½" and 2", ¼ point lower on 2½" and 3" L1.

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Galv.* B	Elec. Weld Black C	Galv. D
2	37.0c	3.68	24	6	24	6
2½	58.5	5.82	27	8.25	27	8.25
3	76.5	7.62	27	8.25	27	8.25
3½	92.0	9.20	29	10.25	29	10.25
4	$1.09	10.89	29	10.25	29	10.25
5	1.48	14.81	33.75	15	33.75	15
6	1.92	19.18	33.75	15	33.75	15

* Discounts based on 14-cent zinc.

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	14.19	17.37	16.20	16.20
1¼	13	16.97	20.79	16.46	19.19
1½	13	18.22	22.31	18.19	21.41
1¾	13	20.35	24.92	20.69	24.35
2	13	22.81	27.94	23.19	27.28
2¼	13	25.69	31.46	25.84	30.42
2½	12	28.40	34.78	28.46	33.50
2½	12	31.28	38.31	31.19	36.67
2¾	12	33.87	41.49	33.05	38.86
3	12	35.78	43.93	34.69	40.82

CLAD STEELS

(Cents per pound; subject to 4.7% increase on base price and extras)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302 ...	....	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	34.00	....	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	33.50	38.00	....	....	....	....	....
321 ...	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel .	33.55	45.15	41.00	54.00	....	....	....
Inconel.	41.23	54.18	....	....	....	....	165.00
Monel..	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	44.00	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S15. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ¾-in. 18.5
- ⅞-in. and larger ... 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter ... 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap and Sleigh Shoe 21
Tire bolts 21
Boiler & Fitting-Up Bolts 31

NUTS

H.P. & C.P.	Reg.	Hvy.
Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in..	12	6.5
⅞-in.-1½-in. ..	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in..	16.5	6.5
⅞-in.-1½-in. ..	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in. .	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS
American Standard
(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	35	28.5
⅝-in. & ¾-in. ..	29.5	22
⅞-in.-1½-in.	24	15
1⅝-in. & larger..	13	8.5
		Light
½-in. & smaller		35
⅝-in. to ⅞-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages)

Plain finish .....48 & 10
Plated finishes .....31 & 10

HEXAGON CAP SCREWS
(1020 steel; packaged: per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. .. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. . 4

SQUARE HEAD SET SCREWS
(Packaged; per cent off list)

1 in. diam x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS
(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger... 16
N.F. thread, all diams.. 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus-$1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

—— Inches —— Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg..26.00-33.00
Industrial xylol ..25.00-33.50
Per ton bulk ovens
Sulphate of ammonia.$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ...17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed.	18.00
Unannealed	14.50
Swedish, c.l.f. New York, in bags.	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns.	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots.	71.00
Brass, 20-ton lots.	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302....	83.00
Zinc, 10-ton lots.	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over....	5.85
Less than 1000 lb ..	6.00
Molybdenum: 99.9%, minus 200 mesh	2.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

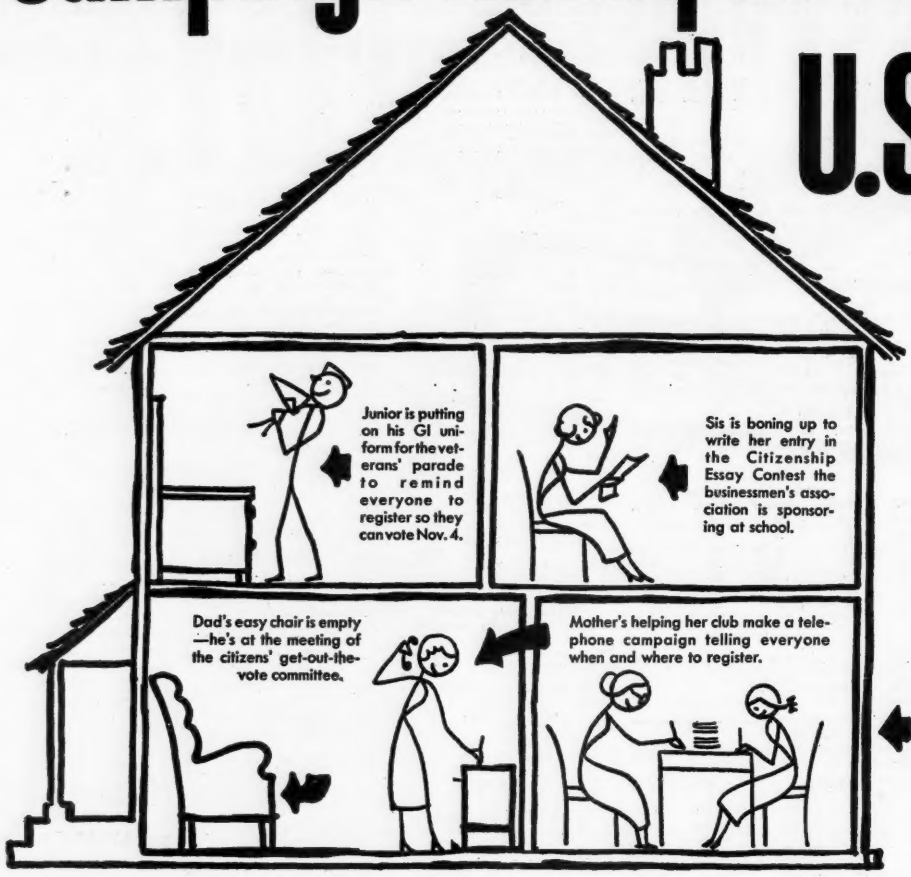
Connellsvil.fur. .$14.50-15.00
Connellsvil.fdy. ..16.50-17.50
New River foundry.... 20.80
Wise county, foundry.. 15.95
Wise county, furnace.. 15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens.$22.75
Everett, Mass., ovens New England, del. .*24.80
Chicago ovens 23.00
Chicago, del. 24.50
Terre Haute, ovens.... 22.50
Milwaukee, ovens 23.75
Indianapolis, ovens 22.75
Chicago, del. 26.62
Cincinnati, del. 25.85
Detroit, del. 27.05
Ironton, O., ovens 22.50
Cincinnati, del. 25.12
Painesville, O., ovens. 24.00
Cleveland, del. 25.82
Erie, Pa., ovens 23.50
Birmingham, ovens .. 20.30
Cincinnati, del. 25.23
LoneStar,Tex., ovens.. 18.00
Philadelphia, ovens 22.70
NevilleIsland,Pa.,ovens 23.00
Swedeland, Pa., ovens. 22.60
St. Louis, ovens
St. Louis, del. 25.40
Portsmouth, O., ovens 22.50
Cincinnati, del. 25.12
Detroit, ovens 24.00
Detroit, del. 25.00
Buffalo, del. 26.58
Flint, del. 26.73
Pontiac, del. 25.56
Saginaw, del. 27.08

*Or within $4.55 freight zone from works.

Campaign Headquarters U.S.A.


Junior is putting on his GI uniform for the veterans' parade to remind everyone to register so they can vote Nov. 4.
Sis is boning up to write her entry in the Citizenship Essay Contest the businessmen's association is sponsoring at school.
Dad's easy chair is empty —he's at the meeting of the citizens' get-out-the-vote committee.
Mother's helping her club make a telephone campaign telling everyone when and where to register.
Grandma's sending registration reminders to all the church members. Even little Sis is helping—rubber-stamping messages on the cards.

The Family Vote will elect the Next President

NOT THE FARM VOTE...
THE BIG-CITY VOTE...
THE LABOR VOTE...
OR ANY PARTY VOTE...

Politicians talk a lot about this and that "bloc" of voters being decisive factors in this election. So do all the pollsters. You can't blame them for trying to dope it out that way in advance . . . but . . .

YOU know you're going to vote your own sweet way when you get behind that voting booth curtain—that where you live or work hasn't got a blankety-bloc thing to do with how you'll vote. You'll vote for what you believe to be in the best interests of your family—your kids—and your kids' kids.

So YOU know that this year—as always—it will be the FAMILY vote that really decides things. And families are working as never before to make sure every American votes. Right now in millions of American families, everyone from Little Sis to Grandma is pitching in to remind every eligible American to register to make sure of the opportunity to vote. And then they'll tackle the job of getting out the vote of every member of America's 44,000,000 families. They're the biggest "bloc" in America—they ARE America!

If your family is already working at the job—congratulations! If you aren't, talk it over at supper tonight, and pitch in tomorrow.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††§		Carbon	Floor
New York (city)	6.56	7.57	8.77	6.86	...	6.89	7.83	11.34‖	6.69	6.90	8.31
JerseyCity(c'try)	6.35	7.27	8.47	6.75	...	6.59	7.53	9.54	6.39	6.60	8.01
Boston (city) ..	6.71	7.55	8.74	6.75	...	6.48	7.74‡	10.80‖	6.76	7.00	8.18
Boston (c'try)..	6.51	7.35	8.54	6.55	...	6.28	7.54‡	10.60‖	6.56	6.80	7.98
Phila. (city) ...	6.35	7.38	8.60	6.70	8.55	6.67	7.69	11.02	6.42	6.49	7.62
Phila. (c'try) ..	6.10	7.12	8.35	6.45	8.30	6.42	7.44	10.77	6.17	6.24	7.36
Balt. (city) ...	6.01	7.37	8.62	6.62	...	6.61	7.62‡	11.37	6.52	6.67	7.90
Balt. (c'try) ..	5.81	7.17	8.42	6.42	...	6.41	7.42‡	11.17	6.33	6.47	7.70
Norfolk, Va. ..	7.60	...	...	...	...	6.44	8.45	...	7.25	6.64	7.33
Richmond, Va. .	6.14	6.95	8.68	6.53	...	6.30	7.38	...	6.58	6.68	7.80
Wash. (w'hse)..	6.31	7.61	8.90	6.89	...	6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)..	6.00	6.85	8.66	6.41	...	6.10	7.15	12.27	6.28	6.50	7.87
Buffalo (w'hse).	5.80	6.65	8.46	6.21	...	5.90	6.95	12.07	6.08	6.30	7.67
Pitts. (w'hse)..	5.80	...	8.45	5.97	...	5.83	6.90	10.65	5.95	6.10	7.18
Detroit (w'hse).	6.07	6.92	8.34	6.13	7.70-8.03	6.30	7.10	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.39	6.20	...	6.09	7.18‡	10.99	6.53	6.42	7.72
Cleve. (w'hse) .	5.80	6.65	8.19	6.00	...	5.89	6.98‡	10.79	6.33	6.22	7.52
Cincin. (city) ..	6.28	6.87	8.67	6.36	...	6.28	7.31	11.22	6.57	6.62	7.75
Chicago (city)..	6.00	6.85	8.25	6.03	...	6.03	7.00‡	10.85	6.15	6.20	7.38
Chicago (w'hse)	5.80	6.65	8.05	5.83	...	5.83	6.80‡	10.65	5.95	6.00	7.18
Milwau. (city) .	6.17	7.02	8.22	6.20	...	6.20	7.27‡	10.02	6.32	6.37	7.55
Milwau. (c'try).	5.97	6.82	7.02	6.00	...	6.00	7.07‡	10.82	6.12	6.17	7.35
St. Louis (del.)	6.30	7.15	8.55	6.34	...	633.	7.40‡	11.15	6.55	6.60	7.78
St. L. (w'hse) .	6.10	6.95	8.35	6.14	...	6.13	7.20‡	10.95	6.35	6.40	7.58
Birm'hm (city).	5.95	6.80	7.85[2]	5.95	...	5.95	8.40	...	6.10	6.25	8.65
Birm'hm(w'hse)	5.80	6.65	7.70[2]	5.80	...	5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city).	6.80	8.65	10.00	6.95	11.40	6.77	8.85	12.25	6.80	6.85	9.10
L. A. (w'hse)..	6.60	8.45	9.80	6.75	11.20	6.57	8.65	12.05	6.60	6.65	8.90
Seattle-Tacoma.	7.46	9.26	9.90	7.89	...	7.22	9.62	10.90‖	6.91	7.24	9.07
SanFran.(w'hse)	6.90	8.35	9.80	6.90	...	6.80	8.70	12.05	6.65	6.90	9.05

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ add 25-cent special bar quality extra; ‖ as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb.; [4]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 25:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.06

REFRACTORIES

(Ceiling prices, effective Feb. 12, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $85; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $94.60; Salina, O., $99.60; Niles, O., $104; Los Angeles, Pittsburg, Calif., $126.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $94.60; Hays, Pa., $100.10; Niles, O., $102; E. Chicago, Ind., Joliet, Rockdale, Ill., $104.50; Cutler, Utah, $111; Los Angeles, $117.

Insulating Fire Brick

2300° *F:* Massillon, O., $170; Clearfield, Pa., $171; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $178.

Ladle Brick

Dry Pressed: Bessemer, Ala., $61.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $66; Mexico, Mo., $70; Clearfield, Pa., Portsmouth, O., $79.20; Perla, Ark., $88; Los Angeles, $105; Pittsburg, Calif., $106.

Sleeves

Reesdale, Pa., $121; Johnstown, Pa., $121.30; Clearfield, Pa., $128.70; St. Louis, $131.45; Athens, Tex., $134.20.

Nozzles

Reesdale, Pa., $193.60; Johnstown, Pa., $198.55; Clearfield, Pa., $209; St. Louis, $213.95; Athens, Tex., $214.50.

Runners

Reesdale, Pa., $150.70; Johnstown, Pa., $154; Clearfield, Pa., $160; St. Louis, $162.25; Athens, Tex., $166.10.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $158.40; Danville, Ill., $161.40.
60 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $200.20; Danville, Ill., $203.20.
70 *Per cent:* St. Louis, Mexico, Vandalia, Mo., $233.20; Danville, Ill., $236.20; Clearfield, Pa., $240.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ¾ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 223, Sept. 22 issue; manganese and titanium alloys and "other" ferroalloys, page 181, Sept. 15.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Sept. 25	$43.00
Sept. 18	43.00
Aug., 1952	43.00
Sept., 1951	44.00
Sept., 1947	37.83

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3, oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.60

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6. For preparing into:
(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into Grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks.	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop broken machinery.	52.00

OPEN MARKET

(Delivered prices include broker's commission.)

Birmingham
(Delivered)

No. 1 Cupola Cast	$47.00-48.00
Stove plate	42.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00

Buffalo
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 busheling	44.00
No. 2 bundles	43.00
Machine shop turnings.	34.00
Mixed borings, turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	47.00-49.00
No. 1 machinery cast	49.00-50.00

Chicago
(Delivered)

No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings.	33.50
Mixed borings, turnings	35.00-36.00
Shoveling turnings	37.50
Cast iron borings	35.00-36.00
No. 1 cupola cast	47.00-49.00
Charging box cast	43.00-45.00
Heavy breakable	43.00-45.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	44.00-46.00
Clean auto cast	50.00-52.00
Unstripped motor blocks	37.00-39.00
Malleable	53.00-55.00
Drop broken machinery	50.00-52.00

Cleveland
(Delivered)

No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings, turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery.	52.00

Detroit
(F.o.b. shipping point)

No. 1 cupola cast	49.00†
Heavy breakable	45.00†
Clean auto cast	52.00†
Unstripped motor blocks	43.00†
Drop broken machinery	52.00†
Charging box cast	47.00†

†Ceiling price.

Los Angeles
(Delivered)

No. 2 bundles	29.00
No. 1 cupola cast	49.00

New York
(Brokers' buying prices)

No. 2 heavy melting	35.99
Mixed boring, turnings	29.99
Machine shop turnings.	25.99
Cupola cast	42.00-43.00
Unstripped motor blocks	36.00-37.00

Philadelphia

No. 1 heavy melting	41.50†
No. 2 heavy melting	41.50†
No. 1 bundles	42.50†
No. 2 bundles	41.50†
No. 1 busheling	42.50†
Mixed borings, turnings	36.50†
Machine shop turnings.	32.50†
Short shoveling turnings	36.50†
No. 1 cupola cast	46.00-48.00††
Unstripped motor blocks	41.00††
Heavy breakable	45.00†
Machinery cast	52.00†

†Ceiling price. ‡Nominal.
§Shipping point. ††Delivered.

Pittsburgh
(Delivered)

No. 2 heavy melting	44.00†
No. 1 bundles	45.00†
No. 2 bundles	44.00†
Machine shop turnings.	35.00†
Shovel turnings	39.00†
No. 1 cupola cast	48.50
Heavy breakable	45.00

†Ceiling price.

San Francisco
(Delivered)

No. 2 heavy melting	31.00
Machine shop turnings.	17.00
No. 2 bundles	29.00
No. 1 cupola cast	45.00

Seattle
(F.o.b. shipping point)

No. 1 cupola cast	44.00
Heavy breakable	40.00
Unstripped motor blocks	38.00

St. Louis
(Delivered)

No. 1 cupola	41.00
Unstripped motor blocks	39.00

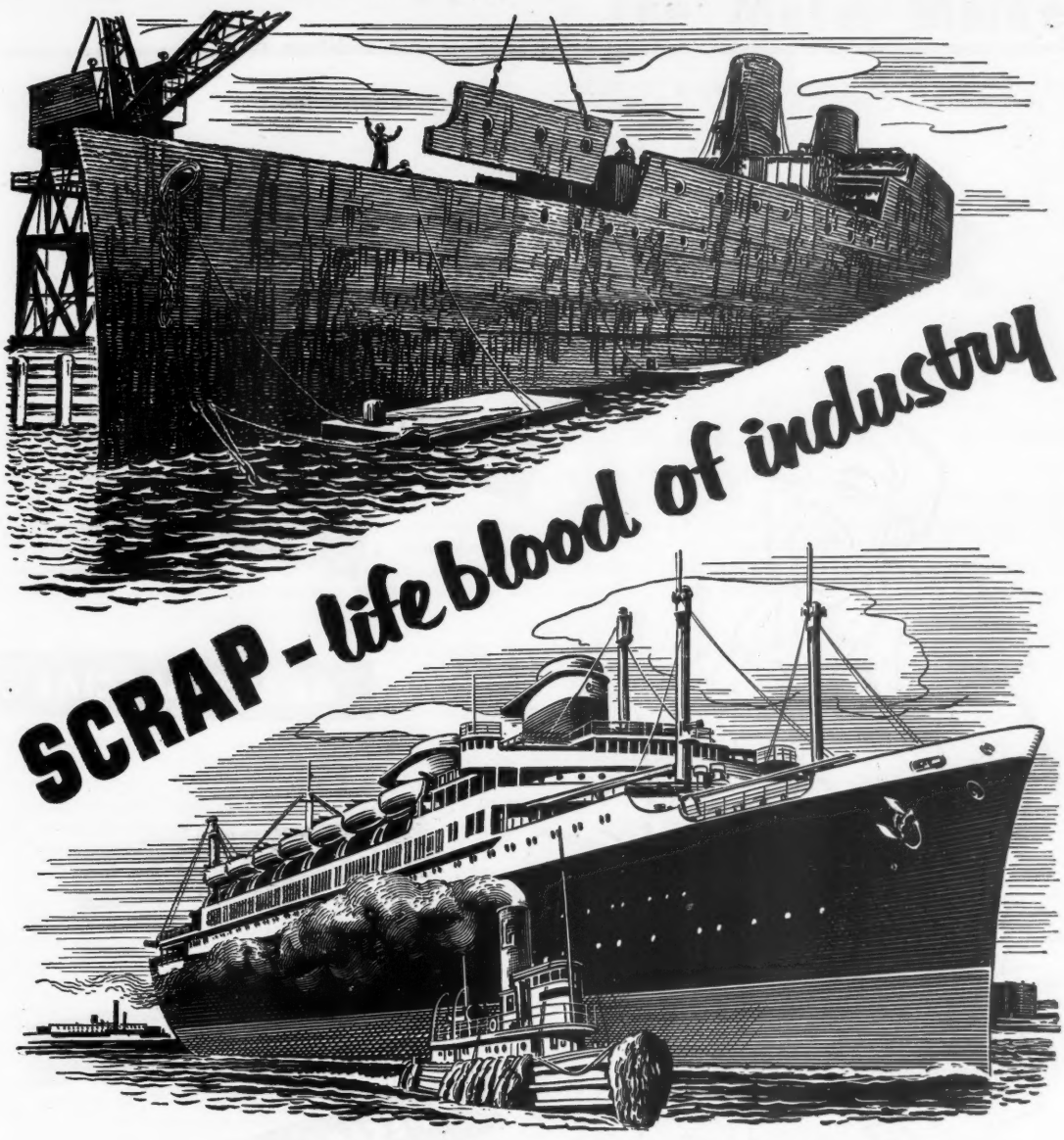
Youngstown
(Delivered)

No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings.	34.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt.	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.80
Busheling	30.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades†	
No. 1 Machinery Cast	50.00

†F.o.b., ‡shipping point.



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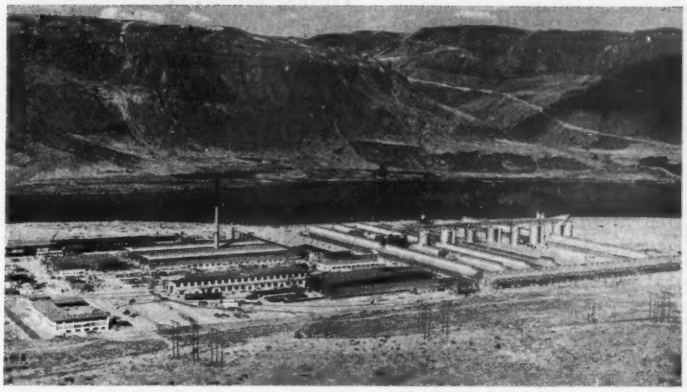
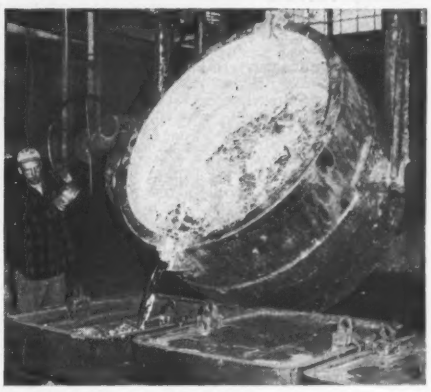
The Metal Market





Alcoa Builds Nation's Newest Aluminum Plant in Washington

The nation's aluminum potential received a welcome boost from construction of Alcoa's $45-million smelting works at Wenatchee, Wash. At the left, a view shows the south side of the plant. Hills in the background conceal the Columbia river, a future power source. At the right, an Alcoan tilts a crucible to pour molten aluminum into molds which form 700-pound pigs of commercially pure aluminum. With Wenatchee's expected annual capacity of 170 million pounds of aluminum, the domestic producing capacity is expected to reach nearly 3 billion pounds late next year

Demand for metal expected to remain strong after turn of the year. Whether supplemental allowances will be made depends on production more than on military take

WITH business optimism riding a swelling tide and first-quarter allocations of copper and aluminum no more generous than at present, fabricators will still be howling for more metal after the turn of the year when things are supposed to quiet down.

Whether supplemental allowances will be forthcoming then depends on production more than on military take, which probably won't be lowered. Aluminum is engaged in its annual battle with the Northwest droughts that rainmakers can't whip and copper is improving greatly because of heavy imports from Chile. The price jumble in copper is becoming more grotesque by the day and OPS shows no inclination to clear it up. To do so might mean further alteration of fabricators' ceilings that could compound the confusion.

Abstractions — All the talk about closer balance in copper and aluminum doesn't help fabricators champing at the controls bit. It seems a bit academic to them when they get no tangible evidence of improvement. Makers of civilian products allowed about half their pre-Korea use of copper and aluminum can't be blamed for their impatience.

Requirements of claimant agencies for copper in the first quarter swelled slightly to 117.2 per cent of total supply while aluminum dropped 2.7 per cent to 123 per cent of total supply. NPA's Canadian division will get 1350 tons of aluminum in the first quarter as against only 1200 in the fourth. That's despite freeing of semifabricated copper and aluminum from control in Canada because of easing production pressure at mills.

Antics in Zinc — More and more metals next year will go from the realm of allocation and supply to that of demand and price. What's happening now in zinc and lead may be a preview of what to expect in copper, aluminum and other metals in the future.

People just aren't buying zinc as expected. The steel strike sent thousands of tons of zinc business down the drain. The metal was in approximate balance before the strike, as was lead. Imports of foreign metal keep swelling total supply of both metals. Shipments have continued with only a pause to absorb reimposed import tariffs. Ceiling on zinc is 19.5 cents. In the past ten days its range has been 13.5 to 14.5 cents a pound. Last week a dual price of 13.5 and 14.0 cents reigned as custom smelters tried to move the metal by cutting prices. The action brought a few nibbles, including one from GSA for stockpile metal. Lead is currently three cents below ceiling at 16 cents a pound, but with imports heavy and demand just above fair, plus the gyrations in zinc, equilibrium there could be upset too.

Order Backlog Shrinks

Copper statistics show fabricators' unfilled orders going into September were lowest since February. In terms of copper needed, backlog amounted to 294,280 tons while stocks of refined copper held by fabricators increased during the month by nearly 18,000 tons to 298,849 tons. Producers' stocks didn't change, leaving inventory of the entire industry at 352,733 tons. Domestic consumption gained by a third in August from the July doldrums to 119,115 tons. New orders booked were largest since April at 109,630 tons of copper needed.

Time Limit on Stockpiling

Temporary stockpiling of metals by the government won't be extended beyond the present lead program, says Defense Materials Procurement Agency in report on progress in metals expansion programs. To date, DMPA has developed programs to expand production of 17 metals and 22 nonmetallic minerals. Four of the metals programs have been completed, 11 are now between 70 and 100 per cent complete and only two are not 70 per cent complete. DMPA's copper program calls for a 25 per cent expansion by 1955 and its nickel program by 35 per cent in the same period.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 13.50c; brass special 13.75c; intermediate 14.00c, East St. Louis; high grade 14.85c, delivered.

Lead: Common 15.80c; chemical 15.90c; corroding 15.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.00c, pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 39.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 39.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $190-$193 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.00 del; special or patented shapes $2.15.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze, 95% 45.15; 90% 44.38; red brass, 85% 43.10; 80% 42.34; best quality, 41.35; nickel silver, 18%, 55.08; phosphor-bronze grade A, 5%, 64.71.

Rod: Copper, hot-rolled 41.37; cold-drawn 42.62; yellow brass free cutting, 33.85; commercial bronze 95%, 44.84; 90% 44.07; red brass 85%, 42.79; 80%, 42.03.

Seamless Tubing: Copper 45.56; yellow brass 43.18; commercial bronze, 90%, 47.04; red brass, 85%, 46.01.

Wire: Yellow brass 40.46; commercial bronze, 95%, 45.44; 90%, 44.67; red brass, 85%, 43.39; 80%, 42.63; best quality brass, 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 32.795; 30,000 lb lots, 32.92; l.c.l., 33.42. Weatherproof, 100,000 lb, 33.60; 30,000 lb, 33.85; l.c.l., 34.35. Magnet wire del., 15,000 lb or more, 38.75; l.c.l., 39.50.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	31.6	...	...
0.135-0.096	12-48	32.1	...	...
0.095-0.077	12-48	32.8	30.6	34.9
0.076-0.061	12-48	33.4	30.8	35.1
0.060-0.048	12-48	33.7	31.0	35.4
0.047-0.038	12-48	34.1	31.3	35.7
0.037-0.030	12-48	34.5	31.7	36.3
0.029-0.024	12-48	35.1	32.0	36.8
0.023-0.019	12-36	35.7	32.7	37.5
0.018-0.017	12-36	36.4	33.3	38.4
0.016-0.015	12-36	37.3	34.0	39.5
0.014	12-24	38.3	35.0	40.8
0.013-0.012	12-24	39.3	35.7	41.7
0.011	12-24	40.3	36.8	43.3
0.010-0.0095	12-24	41.4	37.9	44.8
0.009-0.0085	12-24	42.6	39.1	46.6
0.008-0.0075	12-24	44.0	40.3	48.4
0.007	12-18	45.5	41.7	50.6
0.006	12-18	47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats*	—Round— R317-T4	—Round— 17S-T4	—Hexagonal— R-317-T4	—Hexagonal— 17S-T4
0.125	54.6	....	....	....
0.156-0.0188	46.2	....	....	....
0.219-0.313	43.6	....	....	....
0.375	42.0	48.3		50.4
0.406	42.0	....	....	....
0.438	42.0	48.3		50.4
0.469	42.0	....	....	....
0.500	42.0	48.3		50.4
0.531	42.0	....	....	....
0.563	42.0	....	....	47.3
0.594	42.0	....	....	....
0.625	42.0	45.7		47.3
0.688	42.0	....		47.3
0.750-1.000	41.0	43.1		44.6
1.063	41.0	....		43.1
1.125-1.500	39.4	41.5		43.1
1.563	38.9	....	....	....
1.625	38.3	....	....	41.5
1.688-2.000	38.3	....	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $21.00 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $21.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 21.25c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 22.50c; over 12-in., 22.50-23.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. 22-25	24.50	15.80	13.50	121.50	20.00	39.00	56.50	83.25
Sept. 18-20	24.50	15.80	14.00	121.50	20.00	39.00	56.50	82.25
Sept. 12-17	24.50	15.80	14.50	121.50	20.00	39.00	56.50	83.25
Sept. 2-11	24.50	15.80	14.00	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	15.80	14.067	121.50	19.923	39.00	56.50	83.25
July Avg.	24.50	15.80	15.00	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	15.06	15.74	121.50	19.00	39.00	56.50	82.75
May Avg.	24.50	15.519	19.50	121.50	19.00	42.077	56.50	85.356
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Sept. 1951 Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Sept. 1947 Avg.	21.50	14.825	10.50	80.00	15.00	33.00	35.00	....

NOTE: Copper: Electrolytic, del. Conn. Valley, Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 12.50-12.75; battery plates 7.00-7.50; linotype and stereotype 13.50-14.00; electrotype 12.00-12.50; mixed babbitt 14.50-14.75.

Zinc: Old zinc, 6.00-6.50; new die cast scrap, 6.00-6.50; old die cast scrap, 4.75-5.00.

Tubular Goods . . .

Tubular Goods Prices, Page 145

Boston—Little new volume is open for fourth quarter in seamless pipe. Buttweld schedules include openings in December for distributors, who are taking allocations in full. Tubing specialties are booked to set-aside limits with some openings for civilian orders. If military requirements hold for first quarter, only March will be open. This applies to mechanical and pressure tubing. Light wall electric welded tubing is freer with most producers soliciting volume.

Philadelphia—Pipe looms as one of the toughest supply problems of next year. Seamless will be in critical supply through most of 1953, buttweld and lapweld through the first six months.

Seattle—The cast iron pipe market is inactive. No heavy tonnages are up for bids. A water system at Richland, Wash., originally calling for 2000 tons of cast pipe will go concrete, a submarine section of 5000 feet of 20 and 36-in. to be steel plate, sub-contract pending.

Sheets, Strip . . .

Sheet and Strip Prices, Page 141 & 142

Philadelphia—Demand for sheets and strip, hot and cold-rolled, stays high, but much of the 40 per cent military set-aside in first quarter may revert to civilian users, aiding in a speedy catchup. Sheets, strip and strip mill plates may be hard to sell in second quarter. Straight chromium stainless sheets aren't active, but those that can use such are reconciled to the loss of nickel-bearing types. Alan Wood Steel Co. is installing a new continuous pickler and two shearing lines in a $2.7 million program that could be a preliminary step for a new cold strip mill at Conshohocken, Pa. The equipment is being supplied by Wean Engineering Co., Warren, O. The United Engineers & Constructors is the contractor and installer. Two shearing lines, one for the 26-in. strip mill, and the new pickler scheduled for operation next July, will increase shearing and pickling capacity sufficiently to handle material for the hoped-for $5 to $8 million cold strip mill that has been talked about for some time by the company.

Boston—Flat-rolled steel products consumers are placing first quarter orders. Mills have varying tonnage available. Some buyers lack tickets, but considerable fourth quarter cold-rolled sheet volume is being placed for rolling during January-February. Nonintegrated cold strip producers have fourth quarter openings for both carbon and alloy. Turnback of military tonnage against set-asides is not heavy. Some narrow strip and cold-rolled sheets may be included.

New York—Sheet backlogs will clear up in first quarter, but little or no new tonnage can be placed this year. Producers think they'll be selling strip in first quarter rather than just distributing it. However, when space opened for strip on one mill's books for December delivery, it was snapped up in a couple hours. Business is picking up in a lot of lines.

Pittsburgh—Sheet supply is easing. Isolated instances are reported of improved availability. Picture for the first quarter of 1953 is brighter than it has been for some time. When books are opened for first quarter there will be open space in March.

Cleveland—Generally tight supply conditions in hot and cold-rolled sheets and strip are expected to continue through first quarter next year. While some consumers appear adequately supplied to sustain operations, others are having difficulty getting sufficient tonnage. Over-all, the situation is described as spotty with government allotments regulating the flow of tonnage to separate consumers. Recent expansion in activity on the part of appliance manufacturers is adding to the pressure for light, flat-rolled products. Stovemakers are reported having trouble getting all the 22-gage cold-rolled sheets they would like. On the other hand a manufacturer of office appliances reports little difficulty in obtaining flat-rolled specialties, such as electro-galvanized strip.

Chicago—Sheetmakers confront exceptionally heavy demand. Manufacturers of autos, appliances, radio, television, farm implements, etc., are seeking all the tonnage they can get. Good volume through first quarter is assured.

St. Louis—Sheet steel demand is undiminished, especially from appliance and farm equipment makers. Consumers' chief trouble is balancing inventories and many are filling in from warehouses and conversion. Fourth quarter mill schedules are filled and there are indications first quarter will be trimmed drastically in an effort to get current on deliveries which now average two months behind.

Los Angeles—First flat-rolled steel from eastern sheetmakers since the strike is scheduled to arrive here in October. Sheet metal fabricators expect active fourth quarter business with removal of Regulation X.

Structural Shapes . . .

Structural Shape Prices, Page 141

Philadelphia — Structural shapes have moved into better supply position with some producers booking deliveries for January and February on fourth quarter rated orders, while knocking out back work at a rapid clip. A fair number of inquiries is reported, but new work isn't coming in as fast as deliveries. Refinery building is slated for a spectacular spurt in coming months. One estimate of its size—some 7000 to 8000 tons of shapes alone will be needed.

Boston—That a 30-day inventory limit for structural steel fabricators is impracticable is recognized by the granting of an exemption on contract inventory or steel ordered for a specific project. Inventory control for this industry appears on the way out. Allotments to fabricators, fourth and first quarter, will be 80 and 60 per cent respectively of third quarter, 1952, allocations which totaled 1,680,000 tons—996,000 tons structural shapes and 684,000 tons plates.

New York—Bridgework awards recently have been few in this district, but with a number of good-sized projects in the offing, thousands of tons of structurals should be out before end of January.

Portland, Oreg.—The Dalles-Wasco county court has called for bids Oct. 15 for construction of a Columbia river bridge at a new site. The original contract went to Guy F. Atkinson & Co. in January, 1951, on a bid of $1,998,527. U. S. Engineers, however, appropriated the site for a dam project. The government has reimbursed the county. The job involves 3500 tons of shapes, 600 tons of reinforcing, 1650 feet of steel piling. Some steel fabricated for the original project will be furnished by the county.

Seattle—Fabricators are encountering difficulty in obtaining steel. Inventories are nearly exhausted and shipments are not coming in as expected, especially from eastern producers. Demand is fairly active.

Wire . . .

Wire Prices, Page 143

Boston—Some first quarter wire orders have been booked but pressure beyond fourth quarter is only moderate. Most producers have openings for the period on numerous items including high carbon specialties.

Plates . . .

Plate Prices, Page 141

New York—Plate users realize the futility of badgering producers for shipments. Rated work has eaten up practically all available tonnage this year. One producer reports only universal mill plates available for rated work in fourth quarter. Heavy atomic energy requirements for plates, shapes and structurals will bite deep into an already-lean first quarter supply available for non-defense uses.

Boston—For grades requiring longer lead time, including low-alloy, high-strength plates, books are open for first quarter tonnage. Highly rated needs predominate, nondefense space being limited. More consumers of light plates are in trouble, having depleted inventories. Replacements lag because of pressure on sheet-strip mills. But more strip-mill plate is expected next quarter.

Philadelphia — Exception to the general rule on plates is the report one mill still has tonnage available for December on set-asides. First quarter plate books open Oct. 2. Atomic energy, Navy and other military contractors want fast delivery. At Claymont, Del., the flange shop is running but the pipe mill is down until the plate mill starts rolling again, perhaps this week. The producer has taken no orders since the strike ended, and will accept no fourth quarter tickets, and few for the first quarter, depending on the mill's behavior starting up.

Pittsburgh — Cancellation of steel plate orders are limited as result of the DPA announcement civilian allocations will be cut 25 per cent for first quarter, 1953.

Los Angeles—Producers have little tonnage to offer fabricators scratching for steel to keep their plants going. Kaiser Steel Corp. moved third quarter tonnage into fourth quarter

and blanked out January for arrearages.

Seattle—Navy landing craft and barges, as well as penstocks and tunnel liners awarded Portland fabricators involve nearly 30,000 tons of plates for work in progress or under contract. Steel continues in short supply.

Pig Iron . . .

Pig Iron Prices, Page 140

Cleveland—Foundries in this area would increase their pig iron inventories were they permitted by government regulations to exceed 30-days' stocks. As has been the case for some time past, the heavy shops generally are operating full time with the lighter foundries averaging four to five days weekly. Recently, some of the makers of heavy castings have noted openings in production schedules, but in general the heavy shops hold comfortable order backlogs. Pig iron shipments are being received steadily and on schedule, but with inventories pretty well depleted during the steel strike most foundries are anxious to replenish stockpiles. Assurances have been given by NPA that the inventory limitation will be relaxed just as soon as such action is justified by the general supply outlook. Some spotty shortages of iron are reported, but it is said these, to some extent, are occasioned by the switching of blast furnaces from production of one grade to another.

Detroit—Great Lakes Steel Corp. blew in its new blast furnace on Zug Island Sept. 22, adding 480,000 tons to its annual pig iron capacity. Iron from this stack will be used in the company's open hearths. Simultaneously, another National Steel Corp. subsidiary, Weirton Steel Co., lighted a new stack in West Virginia. The two furnaces bring National's total to 12.

Chicago—Pressure for pig iron has slackened considerably with most foundries reasonably well supplied. Explanation is high level output and somewhat lessened demand resulting from restricted manufacture of automobiles and farm equipment. Of the district's 42 blast furnaces, 39 are active.

Boston—Foundry melt is well below capacity. Jobbing shop operations do not average better than four days weekly while textile equipment builders are not melting at capacity despite some outside defense work. Demand for machine tool castings leads, but appears over the peak. These factors, combined with 30-day inventory limitation, retards iron shipments. The district blast-furnace is building moderate reserves of No. 2 foundry and malleable. One steelworks bought 4500 tons of basic from a New York state furnace.

New York — Steel foundries are operating at a higher rate than gray iron shops, having more defense work on books. Iron foundries are melting well below capacity in many cases, the industry averaging about 70 to 75 per cent. Jobbing shops are generally below that rate. Demand for pig iron is easier, but supply is still rated tight due to the limited merchant tonnage available.

Buffalo — Shortage of freight cars presents a problem for merchant pig iron shippers. Demand, however, is slower, especially from the smaller foundries. Lack of new orders is reported from nearby melters, but shipments to Michigan motor casters continue substantial.

Philadelphia — Foundry operations are slack, but better than in midsummer. Foundry use of pig iron hasn't been helped by the price increase, though demand is generally active. Inventories are low but not dangerously so, and no squeeze is due this winter. Shipments from Alabama and Texas round out inadequate production in this area.

St. Louis—Smaller pig iron users who normally buy outside this area report difficulty getting supplies, so pressure on local furnaces is increasing. Consumers supplied locally have been on the same allocation six months or more and generally are getting deliveries without hardship or production curtailment.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 141

Cleveland—Seasonal slowing down in building operations is expected from here on with resulting slackening in pressure for reinforcing steel. Considerable work is being figured, however. Most important pending job involves several thousand tons of reinforcing bars for the proposed lake front post office building here. It is expected bids will be asked on this project within the next month or so. Also pending for immediate future placement are 400 tons of bars for the Ohio turnpike piers in Summit county. Numerous school and other public building projects as well as small commercial structures are being figured currently.

Iron Ore . . .

Iron Ore Prices, Page 147

Cleveland—Lake Superior iron ore consumption jumped sharply in August, reflecting resumption of blast furnace operations following termination of the 2-month steel strike.

Total consumption in the month, U. S. and Canadian, was 7,243,081 gross tons. This is an increase of 5,699,020 tons compared with July consumption of only 1,544,061 tons. It is down 455,603 tons compared with use in August, 1951.

Total stocks of ore at furnaces, U. S. and Canadian, on Sept. 1 were 29,448,791 tons. This compares with 22,903,749 tons on Aug. 1, and with 35,056,899 tons on Sept. 1, 1951. Stocks on Lake Erie docks Sept. 1 were 4,688,100 tons against 4,484,051 on Aug. 1, and 4,863,081 on Sept. 1 a year ago. Total stocks at furnaces and docks, including Canadian furnaces, on Sept. 1 were 34,136,891 compared with 39,919,980 last year.

Out of 197 blast furnaces in the U. S. and Canada depending chiefly on Lake Superior ore only 12 were idle on Sept. 1, 11 in the U. S. and 1 in Canada. A year ago 6 were idle in the U. S. and 1 in Canada.

Shipments of Lake Superior iron ore in the week ended Sept. 22 were 3,190,139 gross tons, decline of 191,835 tons from the preceding week. In the like week a year ago shipments totaled 3,003,743 tons. Total movement from the upper lakes to date this year now stands at 47,856,242 tons, off 19,924,593 tons from shipments of 67,780,835 tons in the like period of the 1951 lake navigation season.

Steel Bars . . .

Bar Prices, Page 141

Cleveland—Steel buyers have little prospect of getting their bar requirements promptly satisfied over coming months with military and high-rated defense needs pressing on producers. Whatever hope prevailed for early easing in supply conditions was dashed recently when NPA told its bar industry advisory committee military requirements are likely to increase for at least nine months before starting to level off. Scaling down of the military load, however, still is a possibility with a study being made to determine if the military set-aside actually will be absorbed.

Boston—The only easing noticeable is in small bars, 1-in. and under, centered primarily in screw stock, mostly resulphurized grades. The latter is cutting into bessemer sales, one large producer recently expanding in three resulphurized grades either from open-hearth or electric furnace. With little carbon tonnage available for the first two months of 1953, books are being opened for first quarter, limited generally to March for hot-rolled. Military set-asides and carryovers, coupled with converters' allotments and the specified share to warehouses take up fourth quarter schedules, notably larger sizes.

New York—Cold-drawers reportedly are taking imported bars. Quality of foreign bars in the past has been questionable, but the practice is keeping cold drawers busy. Warehouses are chief importers here, taking in plates, sheets, bars and small structurals for sale at a 25 to 30 per cent premium, a drop in price from the days of desperation. Catch-up on bar orders depends on individual sizes and mills, with little difference seen between carbon and alloy types. In general, relief won't come until well into next year.

Philadelphia—Bar mill schedules for first quarter are jammed. Salesmen are trying to keep customers happy while fighting them off. One fabricator with a defense order had to be satisfied with shipment from the mill in six months. Deliveries of hot-rolled bars have slowed considerably, users complain. No imported bars for conversion are reported here. Shell orders take a lot of tonnage and there is not near enough of a finished shell backlog yet.

Pittsburgh—Less military demand for small diameter steel bars is expected during first quarter. Present bar supply is tight and some bolt and nut manufacturers may go to conversion. One bar buyer has been shopping on the West Coast for material.

Chicago—Barmakers are fully committed on defense set-asides. These set-asides, plus other allocations including warehouse and cold-finishers, absorb the bulk of output and explain why this product is under so much pressure. Demand is heavy from all consuming fields. Cold-finishers re-

port demand not as frantic as recently.

Portland, Oreg.—Fair order backlogs are held by the Oregon Steel Mills with the rolling mill on two shifts five days weekly, and the melt shop in continuous operation.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 145

Chicago—Plenty of coke is available for foundry use. Consumer stocks are substantial, fear of a coal strike having spurred inventory building recently. Now that disruption of coal mining has been averted, purchasing activity is likely to diminish.

Scrap . . .

Scrap Prices, Page 148

Pittsburgh—Scrap market here continues slow. While prices are expected to remain at ceiling, there is a definite sign of weakening in cast grades. Pittsburgh area scrap inventories continue high, with mills conserving stockpiles. An exception is the Mahoning valley area where scrap yards are reported holding slim supplies.

Boston—Steel scrap prices are back at ceiling. This firming is reflected in specialty and electric furnace grades. Yards are paying ceilings for unprepared material with volume coming in somewhat slowly. Cast grades are sluggish with freight operating against outside buying. For some grades prices are $5 per ton below ceilings with No. 1 cupola cast $41, shipping point.

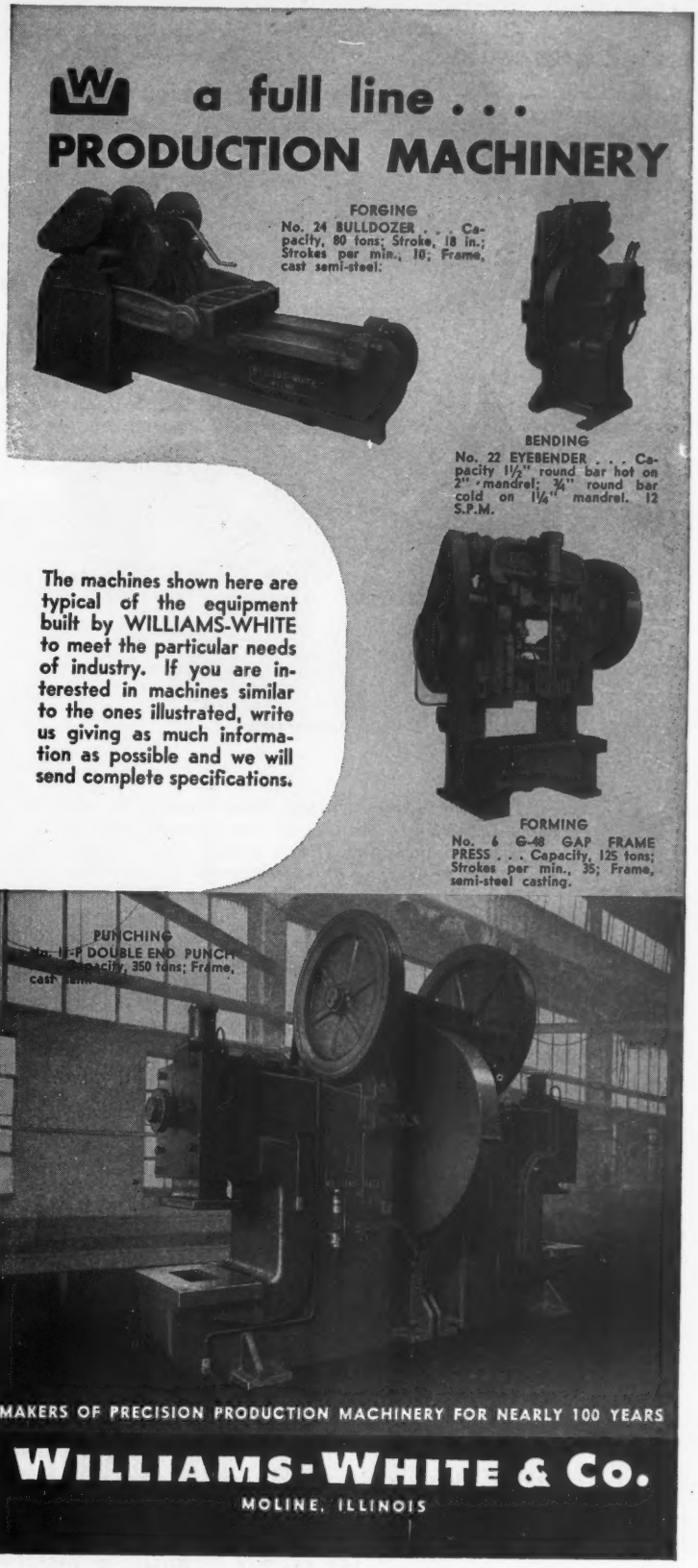
New York—Steel scrap prices have worked back to ceiling, including turnings. Shipments are substantial against old and new orders. Cast grades are moving slowly and are soft pricewise with most selling $5 below celings.

Buffalo — Although softer tendencies rule the scrap market, prices are holding at ceiling levels with the leading consumers placing orders. Tonnages, however, are lighter. Large supplies of cast grades are reported offering with buying negligible. Prices on the latter are being shaded $2.50 to $3 below control levels. Boat receipts continue from the eastern seaboard.

Philadelphia — Scrap prices have firmed up after a brief softness that was corrected when one mill resumed buying. Orders for October requirements are going out now. Mills are well stocked on lesser grades of steelmaking scrap but are pushing hard for quality material. Yards complain about lack of production scrap coming in.

Detroit—Scrap men are optimistic on the long-term outlook for supplies, noting the relatively good inventories which local mills have as proof no scarcity is likely. Better quality scrap is being specified, possible forerunner of some price pressure. For the present, however, ceiling prices are commanded on all grades.

Cleveland—Steelmaking grades of scrap are moving to the mills but the pressure for tonnage is not unusually strong with stocks, comfortable. Buyers are more selective in accepting tonnage. Of late there have been more rejections. Price-wise, however, the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market is firm at ceiling levels on the steel grades and the trade anticipates no early softening with cold weather ahead when collection and preparation are hampered. Also contributing strength is the expectation of continued high-level steelmaking operations through 1953. Cast grades of scrap continue easy with foundry demand restricted.

St. Louis — Scrap shipments are down sharply while mills dip into stocks. Inventories can stand the drain for perhaps another 20 days. Dealer scrap is tight. Foundry grades continue slow and priced under ceiling. A substantial tonnage of cupola cast moved last week $2 under ceiling delivered. Earlier, a sizable purchase of unstripped motor blocks was negotiated at $5 to $7 under ceiling delivered. Foundries report slackening business and cast scrap stocks adequate.

Birmingham — The scrap market here is little changed from a week ago. Some open-hearth and blast-furnace scrap is moving north and one southern steel mill is back in the market for limited tonnages, all at ceiling prices. The cast market is slow, with some sales of No. 1 cupola cast, delivered Birmingham, at $47, and stove plate $42. A few sales elsewhere in the district were reported by brokers at $48 for No. 1 cast.

Portland, Oreg. — Inventories of scrap are satisfactory in this area. Receipts equal current consumption. Some concern is expressed about winter supplies. Ceiling prices are being paid for heavy melting grades.

San Francisco—A softening in the market for No. 1 cupola cast was noted last week, the price easing $1 a ton to $45. Steelmaking grades remain at the levels recently established: $31 for No. 2 heavy melting, $3 under ceiling; $29 for No. 2 bundles, $5 below ceiling and $17 for machine shop turnings, $8 under ceiling.

Seattle—Large scrap buyers are enlarging their inventories as receipts exceed current consumption. No offshore scrap is enroute here, price being uncompetitive. Heavy melting steel commands ceiling prices, but cast grades are quoted $5 or more under top levels.

Warehouse . . .

Warehouse Prices, Page 147

Cleveland — Warehouse order volume is well sustained but total business of some distributors is held down by unbalanced inventories and government restrictions on consumption. Recent pickup in appliance manufacturing activity is expected to bring some additional volume to the warehouses, though the bulk of such buying will be direct from mills. Over-all tonnage receipts from the mills are substantial, but shipments are unbalanced as to size and product.

Boston — Warehouse sales this month are over August volume with most distributors' steel stocks up. Receipts are the gage of sales and are likely to be the controlling factor the next few months. Some mills are falling short of the 120 per cent base period delivery target to ware-

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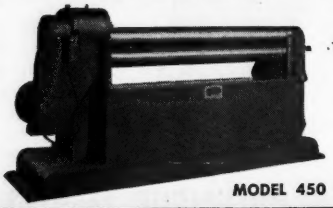

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houses on some items, and few of the latter have been able to build up inventory on shapes, plates and bars.

New York—Lack of balance in mill deliveries hampers warehouses in meeting demand and rounding out stocks. Cars of a given product shipped to distributors frequently are made up of but one size whereas normally a range of sizes would be included. Only on some specialties are warehouses building inventories.

Philadelphia — Warehouses report mill shipments are picking up but there's no better balance of stocks as badly-needed materials come in one door and go out the other. Ten buyers exist for cold-rolled bars and other wanted items. Sheet movement is substantial.

Pittsburgh—Flow of steel to warehouses is steady and while in small quantities assures a variety of products. Plates are available in a good range of thicknesses. Relaxing of the 50 per cent freeze on sheet and strip receipts has increased availability to small fabricators.

San Francisco—Warehouse order volume is good. Complaints are heard of the 15-day government "hold" order freezing 50 per cent of receipts of certain types of steel.

Seattle—Warehouses report large potential demand but their order volume is being held down by lack of supplies. Steel is not being received in sufficient tonnage to permit distributors to enlarge inventories.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 145

Pittsburgh—Demand for bolts and nuts continues strong with many fabricators working to replenish inventories that were cleaned out during the strike. Supply of bars, hot rods and nut flats has not been as ample as hoped for.

Rails, Cars . . .

Track Material Prices, Page 143

Birmingham—The Bessemer plant of Pullman-Standard Car Mfg. Co. closed since late in July due to shortage of steel, resumed partial operations last week and expects to get into full production by Oct. 6.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7000 tons, for refinery, Shell Oil Co., Norco, La., low bidder unnamed.

5000 tons, spillway gates, stoplogs and equipment for government dams, to Gunderson Bros. Engineering Corp., Portland.

3000 tons, approaches to new Delaware river bridge between Portland, Pa., and Columbia, Del., Delaware River Joint Toll Bridge Commission, to Bethlehem Steel Co., Bethlehem, Pa.

2000 tons, including alternatives, extension to Ladd Field, Alaska, power house, to Consolidated Western Steel Corp., Seattle; Lytle & Green and S. Birch & Sons, Seattle, general contractors.

1750 tons, 230 LCM's and barges for U. S. Navy, to Gunderson Bros. Engrg. Corp., Portland.

1200 tons, subcontract for government dam equipment and potline extension Reynolds Metals Co., Longview, Wash., to Fought & Gray, Portland, Oreg.

980 tons, refinery in Brazil, Hydrocarbon Research Inc., New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.

880 tons, highway bridge, Bethlehem, Pa., to

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Adam Eidemiller, low bidder and general contractor.

800 tons, plant building, Du Pont, Circleville, O., direct to Bethlehem Fabricators.

550 tons, building, Monsanto Chemical Co., Texas City, Tex., to Bethlehem Steel Co; Stone & Webster Engineering Corp., Boston, contractor-engineer.

500 tons, Chief Joseph dam powerhouse, to Gunderson Bros. Engineering Corp., Portland, Oreg.

500 tons, expansion Alcoa reduction plant, Vancouver, Wash., to Pacific Car & Foundry Co., Seattle.

350 tons, hangar, Pratt & Whitney, East Hartford, Conn., to Berling Construction Co., Berling, Conn., through Turner Construction Co., Boston, general contractor.

275 tons, tainter gates, Big Cliff dam project, to Gunderson Bros. Engineering Corp., Portland, Oreg.

200 tons, Oregon state highway girder bridge, Hood river, to Gunderson Bros. Engineering Corp., Portland, Oreg.

200 tons, stop logs, McNary dam, Columbia river, to Schmitt Steel Co., Portland, Oreg.

185 tons, pier construction, Port of Portland, to Gunderson Bros. Engineering Corp., Portland, Oreg.

148 tons, state highway bridge, Nassau county, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

137 tons, highway bridge, Northampton county, Pa., to Bethlehem Steel Co., through C. W. Good.

100 tons, raising two bridges for U. S. Engineers at Pasco, Wash., to Gunderson Bros. Engineering Corp., Portland, Oreg.

STRUCTURAL STEEL PENDING

3500 tons, Columbia river bridge, The Dalles, Oreg.; bids to Wasco county, Oct. 15; some materials to be county-furnished.

1000 tons, tower steel; Bethlehem Pacific Coast Steel Corp., San Francisco, low, $2,363,379, to Bonneville Power Administration, Portland, Oreg.

1000 tons, Oregon state bridge, Wilsonville; bids in.

900 tons, sheet piling, fuel storage project, Harpswell, Me.; Verrier Construction Co., Portland, Me., low.

600 tons, single span curved chord Pratt truss bridge with 321-foot square span, Housatonic river, New Milford, Conn.; bids Oct. 6, Hartford, Conn.

500 tons, Oregon state bridge, Coquille river; bids in.

200 tons, plant expansion, Chattanooga, Tenn., Du Pont, bids due Sept. 26.

150 tons, class room building, Worcester Institute of Technology, Worcester, Mass.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2200 tons quartermaster warehouse, Camp Lejeune, N. C., to Virginia Steel Co., Richmond, Va., through Cable Contracting & Engineering Co., Greensboro, N. C.; structural steel to Carolina Steel & Iron Co., Greensboro.

525 tons, chiefly mesh, state highway, Kingston-North, Kingston, R. I., to Plantations Steel Co., Providence, R. I., through S. & M. Construction Co., Providence, general contractor.

REINFORCING BARS PENDING

1120 tons, Lookout dam, Oregon; bids in October to U. S. Engineer, Portland, Oreg.

1000 tons, Battery street vehicular tunnel, Seattle; Morrison-Knudsen Co. and Rumsey & Co., Seattle, low $4,384,061.

850 tons, materials and maintenance buildings, Boeing Airplane Co., Seattle; general contract to Sound Construction & Engineering Co., Seattle.

600 tons, The Dalles bridge, Oregon; bids to Wasco county, Oct. 15.

600 tons, additional materials for Lucky Peak dam; bids to U. S. Engineer, Walla Walla, Wash. about Oct. 1.

435 tons, chiefly mesh, highway project, Vernon-Tolland, Conn., also 195 tons of steel piling, bids Oct. 6, Hartford, Cann.

100 tons, also 220 tons of steel piling, truss bridge, New Milford, Conn., bids Oct. 6, Hartford.

PLATES . . .

PLATES PLACED

3500 tons, 40 barges for Navy, to Gunderson Bros. Engineering Corp., Portland, Oreg.

3500 tons, 190 landing craft for U. S. Navy, to Gunderson Bros. Engineering Corp., Portland, Oreg.

1450 tons, tunnel liners Palisades dam, to American Pipe & Construction Co., Portland, Oreg.

1000 tons, two penstocks, tanks, etc., Chief Joseph dam, Washington state, to Gunderson Bros. Engineering Co., Portland, Oreg.

200 tons, steel penstock, third unit Kerr project, Flathead Lake, Montana, to American Pipe & Construction Co., Portland, Oreg.

RAILS, CARS . . .

RAILROAD CARS PLACED

Alaska Railroad, 80 rebuilt 70-ton hopper cars, to Dulien Steel Products, Seattle, at $3695 per unit.

Atchison, Topeka & Santa Fe, 113 all-stainless steel passenger cars, to the Budd Co., Philadelphia.

Atchison, Topeka & Santa Fe, 500 hoppers, 500 gondolas and 250 covered hoppers to own shops.

Chicago, Burlington & Quincy, one 125-ton flat car to own shops, Havelock, Nebr.

New York, New Haven & Hartford, 100 passenger cars, to Pullman-Standard Car Mfg. Co., Worcester, Mass., shops.

North American Car Corp., seventy-five 70-ton covered hoppers to Pullman-Standard Car Mfg. Co.

St. Louis-Southwestern, one 125-ton flat car to own shops at Pine Bluff, Ark.

Southern Pacific, 1000 seventy-ton flats, 450 hopper bottom 50-ton gondolas, 350 tight bottom 50-ton gondolas, 100 seventy-ton gondolas for sulphur transportation and 100 fifty-ton flats for pulpwood transportation to own shops.

Texas, Mexican, thirty 70-ton gondolas and five 70-ton ballast cars to Pullman-Standard Car Mfg. Co.

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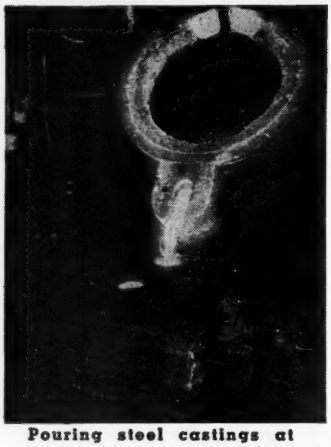

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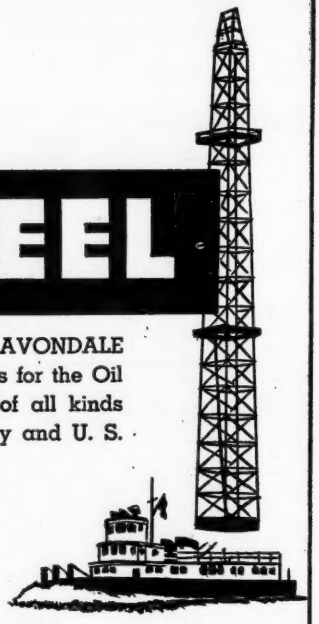

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Algoma Steel Orders Coke Ovens

Algoma Steel Corp. Ltd., Sault Ste. Marie, Ont., awarded Koppers Co. Inc., Pittsburgh, a contract to design and build a battery of 57 chemical-recovery coke ovens. Construction is scheduled to be completed in mid-1953. Each oven will take a 17.5-ton charge of coal and will operate on a 17-hour cycle. Koppers also will construct additional by-product equipment and a coke handling and screening system for Algoma.

Anthes Buys Great North Foundry

Great North Foundry Ltd., Edmonton, Alta., was purchased by Anthes Imperial Co. Ltd., St. Catherines, Ont., and Winnipeg, Man. The Great North Foundry will become the third manufacturing division of Anthes, which is a producer of cast iron soil pipe.

Pressed Steel Car Expands on Coast

Pressed Steel Car Co. Inc., Pittsburgh, is negotiating for the purchase of Axelson Mfg. Co., Los Angeles, and Umpqua Plywood Corp., Eugene, Oreg. Axelson is a manufacturer of petroleum-pumping and aircraft equipment. This expansion is part of Pressed Steel's diversification program to level off the extreme fluctuations of the freight car building industry and to stabilize earnings.

Nicholson File Plans Branch Plant

Nicholson File Co., Providence, R. I., purchased a building site in Port Hope, Ont., for erection of a branch plant. Work on the project is expected to start some time next year.

Ferroalloy Plant Nears Completion

A $1.5 million plant to produce ferromanganese and ferrosilicon alloys is expected to begin operating in Houston soon after the first of the year. Finishing touches are being applied at the Tenn-Tex Alloy & Chemical Corp.'s plant which is situated adjacent to Sheffield Steel Corp.'s steel mill. Stocks of manganese ore are being accumulated at the Tenn-Tex site. The plant will receive its ores from Cuba, India, South America and Mexico.

Anderson Copper Opens Dallas Branch

Anderson Copper & Brass Co., Chicago, opened a branch at 146 Parkhouse, Dallas. J. C. Loehr is manager of the branch while Price Petre is warehouse manager. The company manufactures brass tubing, fittings and shut-off valves.

Burdett To Build Youngstown Plant

Burdett Oxygen Co., Cleveland, will build a $250,000 plant in Youngstown to make oxygen, nitrogen and argon. John R. Spain will be plant manager.

Universal Sheet & Strip Co. Moves

Universal Sheet & Strip Steel Co. is moving into larger quarters at 4900 S. California Ave., Chicago. The company is installing conveyors and hydraulic lifts, flying strip shears and slitters. The pickling plant will remain at the old address, 3232 E. 31st St., that city. Sol Fox is president; R. J. Greene, vice president.

Four Firms To Recover Uranium

First commercial unit for recovery of uranium from phosphate rock is being operated as a part of Blockson Chemical Co.'s plant near Joliet, Ill. Several other processors of phosphate rock have conducted research and pilot plant studies in the field of uranium recovery. International Minerals & Chemical Corp., Chicago, and

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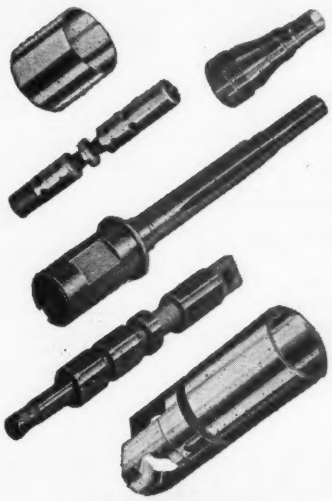

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Virginia-Carolina Chemical Corp., Richmond, Va., are incorporating uranium recovery units into plants now under construction near Mulberry, Fla. Texas City Chemicals Inc. is building a recovery unit at Texas City, Tex.

Form Technical Equipment Sales Co.

E. B. Andrews and Harry S. Robinson organized a new company, Technical Equipment Sales Co., 2430 Central Parkway, Cincinnati. The company will serve as exclusive representative in southern Ohio, Indiana and Kentucky for several manufacturers of machinery, machine tools and precision measuring instruments. Mr. Andrews is the former sales manager of E. A. Kinsey Co. in Indianapolis and Cincinnati and later sales manager of O. K. Tool Co. Mr. Robinson is the former treasurer and general manager of Cincinnati Shaper Co., Cincinnati.

Morris To Represent Warehouses

Morris Steel & Supply Co., 701 Coal Ave. S. E., Albuquerque, N. Mex., will represent Ziegler Steel Service Co., Great Western Steel Co., Eureka Metals & Supply Corp., Howard Supply Co., and other Los Angeles, Calif., warehouses in the Albuquerque area.

Westinghouse Builds Elmira Plant

Television picture tubes for home use and classified government use, as well as transmitting, industrial and special purpose tubes will be manufactured by Westinghouse Electric Corp., Pittsburgh, in its new tube plant at Elmira, N. Y. Building construction for the plant and division headquarters has been completed.

Syntron Agent Opens Newark Office

Syntron Newark Sales Co., representing the entire line of Syntron vibratory materials handling equipment, selenium rectifiers, shaft seals, paper joggers, heating elements, etc., manufactured by Syntron Co., Homer City, Pa., opened headquarters in Hasbrouck Heights, N. J., at 140 Route 17 and Henry street. The rental and sale of electric hammers, rock drills, portable electric saws, etc. will be handled at the same address by Syntron Power Tool Co.

Norgren Buys Rights of Heco Air Gun

C. A. Norgren Co., Englewood, Colo., acquired manufacturing and selling rights of an air blow gun from Heckethorne Mfg. & Supply Co., Littleton, Colo. Norgren also obtained use of the Flex-Tip trademark. This acquisition gives Norgren a complete line of air blow guns which supplements its line of oil fog lubricators, pressure regulators, air filters, relief valves, other air controls, hose couplings and assemblies.

Moloney Electric Builds Addition

A transformer plant addition for Moloney Electric Co. has been completed at 4410 Semple Ave., St. Louis. The company manufactures electric power and light transformers. An area between the addition, designed by Luria Engineering Co., Bethlehem, Pa., and the present plant at 5390 Bircher Rd. was left open for future expansion.

GE Expands Test Facilities

General Electric Co., Schenectady, N. Y., expanded and consolidated under one roof in its Erie, Pa., plant facilities for motor engineering development. This installation, operated by the firm's locomotive and car equipment department, is equipped to test traction motors and generators for locomotives beyond the size of any now being built.

Johnston Moving Plant to Mississippi

Johnston Lawn Mower Corp., subsidiary of Jacobsen Mfg. Co., Racine, Wis., will be located in its new factory and office in Brookhaven, Miss., early in November.

Allis-Chalmers Names Distributors

Allis-Chalmers Mfg. Co., Milwaukee, appointed Komp Equipment Co. Ltd., Hattiesburg, Miss., a distributor for its motors, controls and pumps; Galis Electric Repair Co., Morgantown, W. Va., a certified service shop for Allis-Chalmers motors and controls.

Behr-Manning Starts New Project

Behr-Manning Corp., Albany, N. Y., has begun a new phase of its expansion program. The firm will erect a building as the central point for abrasive disk and floor sanding operations. The company has just completed a new home for its waterproof sandpaper manufacturing operation.

Metalworking Firms Merge

Coleman Division, Fanner Metal Products Co., was formed as a result of a merger between Coleman-Pettersen Corp. and Fanner Metal Products Co., both of Cleveland. This corporation, capitalized for over $1 million, will expand Coleman-Pettersen's line of metal advertising displays, wire baskets, stampings and household appliance component parts into all types of wire and metal products manufacturing. To help accomplish this expansion, 84,000 sq ft of floor

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STEEL Appoints Dr. Gray

Dr. Allen G. Gray, consulting editor to STEEL since 1944, now becomes a full-time member of its editorial staff, in the capacity of technical editor, with headquarters in Cleveland. An authority on the metallurgical and chemical aspects of metalworking and metalprocessing, Dr. Gray for the last 12 years has been associated with the E. I. du Pont de Nemours & Co. Inc. Upon joining that company he became active in development of high speed electrolytic tin plating of steel strip.

During World War II he was on part-time loan from Du Pont to the Metallurgical Laboratory, University of Chicago, where he directed a group working on metallurgical problems for the Manhattan Atomic Bomb Project. During the war, he was engaged also in work on aircraft bearings. In 1946, he transferred to Du Pont's Electrochemicals Department where he was engaged in work in the coatings and corrosion field and exploratory research along chemical-metallurgical lines. He is responsible for a process now used commercially to electropolish stainless steels. Dr. Gray has been associated with the Du Pont Atomic Energy Division at Knolls Atomic Power Laboratory, Schenectady, N. Y., for the last year.

The new editor holds the bachelor of science degree in chemistry and the master of science degree in metallurgy from Vanderbilt University where he did research on molybdenum steels. He received the doctor of philosophy degree in physical chemistry from the University of Wisconsin where he worked on tungsten alloys.

space were acquired in addition to existing Coleman-Pettersen plant facilities in Cleveland and Los Angeles.

Salem-Brosius Inc. Moves Offices

Salem-Brosius Inc., Pittsburgh, established offices at 248 Fourth Ave., that city. Executive and sales activities of the company, including those of the Salem Engineering Division, Salem, O., and the Brosius Division, Pittsburgh, will be directed from the new headquarters.

Readies Plant for Wing Panel Output

Republic Aviation Corp., Farmingdale, N. Y., is tooling up for production of wing panels for jet fighters at the Port Washington, Long Island, plant recently leased from the government. Rehabilitation program is proceeding simultaneously with installation of jigs, fixtures and other production equipment. A major portion of the rehabilitation program, costing about $1,125,000, is being carried out by Walter Kidde Constructors Inc., New York.

Electric Indicator Reorganizes

Electric Indicators Co., Springdale, Conn., announced the retirement from the company of Leo J. Hudson and the continuation of the business by Electric Indicator Co. Inc. under the direction of F. R. Thompson and associates.

Philco Establishes Radio Division

Philco Corp., Philadelphia, is establishing a separate Radio Division so that greater emphasis can be put on all phases of the company's activities in the home and auto radio field. Larry F. Hardy is president of the division; William H. Chaffee, vice president.

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Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Heald #50 Internal Grinder.
Landis 10x18 Plain Grinder, late type.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Cincinnati 16 x 96 Plain Cylindrical Grinder.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2½" hole in spindle, 54" centers.
Lodge & Shipley 20 x 8, single pulley drive, 12 spindle speeds.
Bradford 20" x 18', 4 SCD, 12' center distance, Loose change.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
Oliver Template Tool Bit Grinder.
Liberty 36" x 36" x 18' Double Housing Planer, 2 rail and 2 side heads.
Lodge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
Niles 48" x 48" x 16' Double Housing Planer, 4 heads, box table, DC reversible drive.
Landis 26" x 168" Plain Cylindrical Grinder.
American 30" x 14' G.H. Lathe, 12 speed.
LeBlond 25" x 10' 3 SCD Lathe, 4' centers.
Monarch 24" x 12' G.H. Lathe, complete with 22" 4 jaw chuck and taper attachment.
American 36" x 40' Lathe, Internal Face Plate Drive, with 4" raising blocks, 33' center distance.
Pond 42 x 42 x 10' Double Housing Planer, DC motor drive, 4 heads.
Pond 84 x 84 x 16' Double Housing Planer, DC motor drive, 4 heads.
Cincinnati #2 Centerless Grinder.
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Gondolas, Composite, or All Steel, 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
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End Dump, 20-Yd., 50-Ton Drop Door
End Dump, 10-Yd., 30-Ton Lift Door

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MANUFACTURERS AGENT
Metallurgical Engineer familiar with all phases of Foundry and Metalworking Industries is seeking connection as manufacturers agent or sales representative in Milwaukee area. Write Box 575, STEEL, Penton Bldg., Cleveland 13, Ohio.

PRODUCTION AND COST MANAGER
Univ. Eng. graduate with 20 years' practical experience. Excellent record securing maximum production at minimum of cost. Experience covers scheduling, material control, incentives, standard cost, job evaluation and budgets. Write Box 560, STEEL, Penton Bldg., Cleveland 13, O.

METALLURGIST—AGE 42
21 years' experience in production, rolling and processing of plain carbon steels including plate, sheet, tin-plate, strip and merchant mill products. Experienced also in customer contacts and complaints. 12 years as Chief Metallurgist and Inspector. Location not important. Available immediately. Write Box 564, STEEL, Penton Bldg., Cleveland 13, Ohio.

PLANT MANAGER: M.I.T. GRADUATE WITH 25 years' experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break-even charts, job evaluation, supervisory responsibility chart and labor relations. Capable administrator with excellent record. Write Box 559, STEEL, Penton Bldg., Cleveland 13, Ohio.

Accounts Wanted

ACCOUNT WANTED
Would like to represent a manufacturer of an established product selling Hardware Jobbers and Mill Supply House, also large Consumers (in New York State) whom I have consistently contacted and sold for over 25 years. Write Box 574, STEEL, Penton Bldg., Cleveland 13, Ohio.

QUALIFIED MAN NEWLY ENTERING DIRECT Manufacturers' Agent field in Eastern Michigan and Michigan desires one or two metalworking lines such as screw machine products, hardened & ground, stampings, gears, castings and forgings, or cold heading products. If located or have established business in area, replies should include general location or number of accounts presently served. Address Box 571, STEEL, Penton Bldg., Cleveland 13, O.

Help Wanted

WANTED—DESIGN AND ESTIMATING ENGINEER with industrial furnace experience. Write fully giving experience and salary desired. Drever Company, 736-38 E. Venango Street, Philadelphia 34, Pa.

WANTED: GENERAL SUPERINTENDENT or one who is thoroughly experienced in all phases in manufacturing cold finished bars and now acting in supervisor position either as foreman or assistant to superintendent. Must be able to take full charge of mill operations and understand mill production. Excellent opportunity offered to right party. Plant located in Eastern Seaboard Area. Only those with full knowledge and experience need apply. Replies held absolutely confidential. Write Box 563, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR CLASSIFIED RATES
And Further information write
STEEL, Penton Bldg., Cleveland 13, O.

SALESMAN

Steel warehouse handling Hot-Rolled Steel seeking salesman. Salary basis. Good prospects. Must have following, especially industrial accounts, Greater New York and New Jersey.

CONCORD STEEL CORPORATION
120 Wall Street New York 5, N. Y.

WANTED!

To manufacture and subassemble any unit weighing 1,000# or under. We have ample facilities for all types of machining and assembly of parts. Ample facilities for castings of bronze aluminum, steel and gray iron for above parts. Send us your inquiries and blueprints for quotation.

THE WEBB CORPORATION
Webb City, Missouri

WANTED
USED COLUMN FACING MACHINE
to face 20" square columns.
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Ottumwa, Iowa

STAINLESS STEEL ROUND BARS

TYPE 303					**TYPE 303**		
3/16"	Diameter	Weight	500 lbs.	1-3/4"	Diameter	Weight	2,157 lbs.
5/16"	"	"	620 lbs.	1-15/16"	"	"	2,400 lbs.
1/2"	"	"	500 lbs.	3"	"	"	219 lbs.
5/8"	"	"	228 lbs.	**TYPE 304**			
9/16"	"	"	517 lbs.	1/2"	Diameter	Weight	500 lbs.
11/16"	"	"	231 lbs.	1-5/16"	"	"	1,000 lbs.
3/4"	"	"	1,000 lbs.	3"	"	"	200 lbs.
13/16"	"	"	978 lbs.	3-1/4"	"	"	620 lbs.
15/16"	"	"	23 lbs.	**TYPE 309**			
7/8"	"	"	25 lbs.	5/16"	Diameter	Weight	600 lbs.
1"	"	"	12,000 lbs.	**TYPE 321**			
1-1/8"	"	"	944 lbs.	1"	Diameter	Weight	10,000 lbs.
1-3/16"	"	"	210 lbs.	**TYPE 347**			
1-5/16"	"	"	4,403 lbs.	3/4"	Diameter	Weight	1,002 lbs.
1-3/8"	"	"	2,984 lbs.	1-3/16	"	"	200 lbs.
				1-21/64"	"	"	1,210 lbs.

JANDRU STEEL CORP.
131 Bruckner Blvd. PHONE: (CYpress) 2-5617 New York 54, N. Y.

Ronson Enters Aircraft Parts Field

Ronson Art Metal Works Inc., Newark, N. J., equipped a new and additional plant at N. 13th street and Park avenue, that city, to fulfill an increasing number of subcontracts for aircraft accessories.

Sterling Metal Moves Main Office

Sterling Metal Sales Co. Inc., jobber and distributor of tin mill products, moved its executive offices to 1469 Utica Ave., Brooklyn, N. Y., on the premises of its warehouse in that city.

Electric Regulator Builds Plant

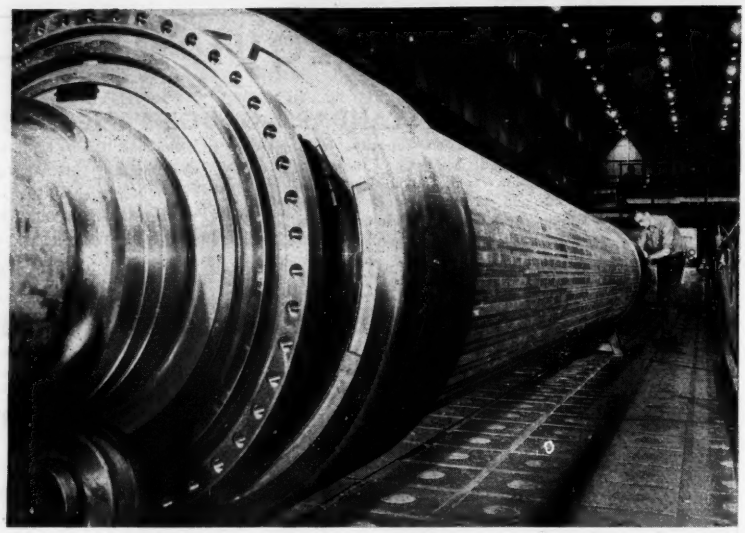
Electric Regulator Corp., Norwalk, O., built a plant and administrative building which houses laboratory, tool room and assembly facilities for production of its electric circuit controller and other products.

Jessop Steel To Build in Canada

Jessop Steel Co., Washington, Pa., will build a plant in Wallaceburg, Ont., which will be used to manufacture high-grade steel.

GM Expanding Canadian Facilities

General Motors Corp., Detroit, will spend $40 million on current and projected construction in Canada by the end of next year. Expansions will be made at all of the company's major plants in Canada: General Motors of Canada Ltd., Oshawa; McKinnon Industries Ltd., St. Catharines; General Motors Diesels Ltd., London; and Frigidaire Products of Canada Ltd., Toronto.



New Generator Rotor is Hot News

This 100,000 pound generator rotor is shown at General Electric Co.'s Schenectady, N.Y., turbine shop. A turbine operating at an initial steam temperature of 1100°F will turn the rotor. Designers expect the high temperature to reduce operating costs by burning less fuel per kilowatt-hour. New home for this rotor is the Kearny, N. J., generating station of Public Service Electric & Gas Co.

Kelite Products Opens Factory

Kelite Products Inc., Los Angeles, manufacturer of cleaning and processing compounds and steam cleaning machines, completed its factory and sales offices at Berkeley Heights, N. J.

Parker Appliance Names Distributor

Parker Appliance Co., Cleveland, appointed Wallace Companies of North Carolina, Bryson City, N. C., as a distributor of its industrial tube fittings and related accessories.

Ferranti Electric Builds Addition

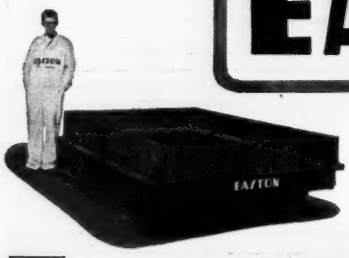
Ferranti Electric Ltd., Toronto, Ont., producer of transformers and other electric equipment, is building a plant addition to cost about $1 million, including equipment. It will have about 42,000 sq ft of floor space.

American Wood Products Buys Mill

American Wood Products Corp., Marion, S. C., subsidiary of American Box Co., Cleveland, aquired a veneer mill at Millry, Ala. Future plans tentatively include the installation of manufacturing machinery and equipment for producing wirebound containers, wood-cleated panel boxes and wood box shooks.

A-1033

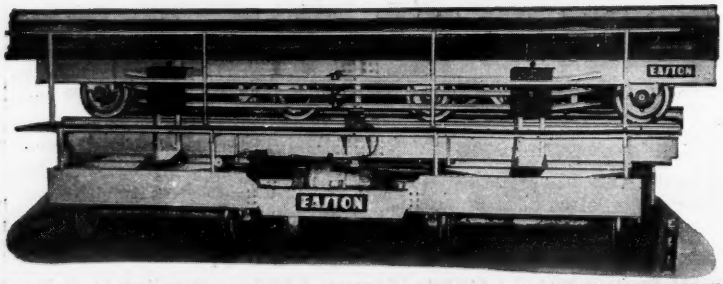
EASTON



EASTON experience covers small and large capacity furnace cars for every requirement.

Furnace Cars

Electric furnace car mounted on electric transfer car for completely automatic continuous heat treating system.



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Advertising Index

Accurate Perforating Co. 162
Aetna-Standard Engineering Co., The ..... Inside Back Cover
Air Reduction 31
Allis-Chalmers ..... Inside Front Cover
Aluminum Company of America 122, 123
Aluminum Import Corporation 33
American Chain & Cable, American Chain Division 124
American Gas Association 144
American Nickeloid Co. 101
American Roller Die Corporation 118
American Society for Metals 120
American Steel & Wire Division, United States Steel Co. 17, 20, 21
American Zinc, Lead & Smelting Co. 150
American Zinc Sales Co. 150
Angier Corporation 137
Applied Research Laboratories 12
Armstrong-Blum Manufacturing Co. 41
"Automatic" Sprinkler Corporation of America 109
Avondale Marine Ways, Inc. 160

Baker-Raulang Co., The 55
Baldwin-Lima-Hamilton, Standard Steel Works Division 110, 111
Basic Refractories, Inc. 7
Belmont Iron Works, The 162
Bethlehem Steel Co. 1
Birdsboro Steel Foundry & Machine Co. 138
Blaw-Knox Co., Lewis Foundry & Machine Division 132, 133
Boiardi Steel Corporation 158
Brad Foote Gear Works, Inc. 26
Bronze Die Casting Co. 158
Brown & Sharpe Mfg. Co. 87, 88, 89, 90

Chain Belt Co. 24
Chemical Corporation, The 5
Chemsteel Construction Co., Inc. 163
Cincinnati Machinery Co., Inc. 164
Cincinnati Shaper Co., The 38
Clearing Machine Corporation 134
Cleveland Crane & Engineering Co., The 113
Cleveland Metal Abrasive Co., The 129
Cleveland Steel Tool Co., The 158
Cleveland Welding Co. 167
Columbia-Geneva Steel Division, United States Steel Co. 17, 20, 21, 22
Columbia Steel & Shafting Co., Summerill Tubing Co. Division 130
Columbus McKinnon Chain Corporation 157
Crucible Steel Company of America 11

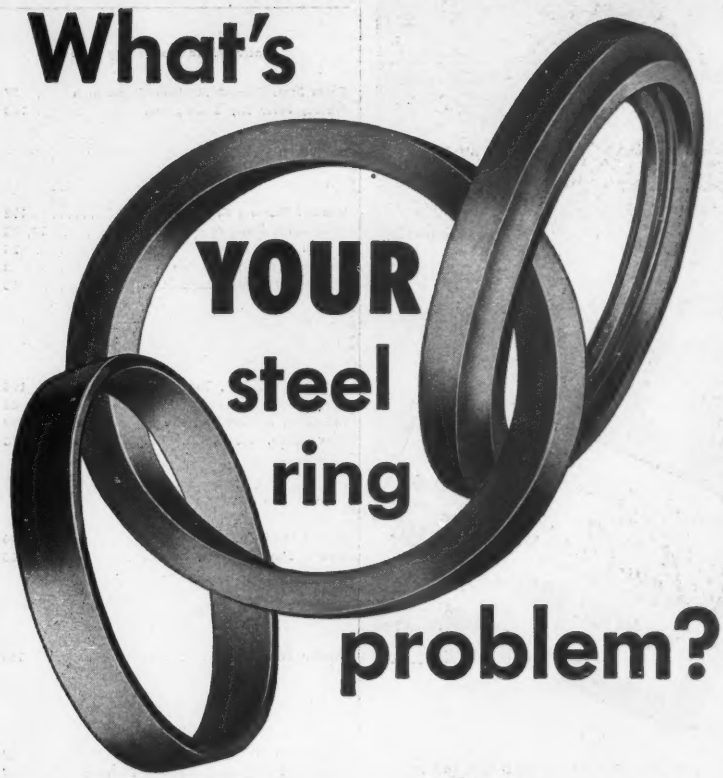
Delco Products Division of General Motors Corporation 30
Detroit Stamping Co. 163
Detroit Steel Corporation, Reliance Steel Division 42
Du Pont, E. I., de Nemours & Co., Inc. 29

Eastern Machine Screw Corp., The 162
Easton Car & Construction Co. 166
Eaton Manufacturing Co., Foundry Division 4
Electric Controller & Mfg. Co., The 74
Electric Products Co., The 6
Electric Service Co., The 164
Engineering Manufacturing Co. 162

Fairbanks, Morse & Co. 13

Continued on following page

What's YOUR steel ring problem?

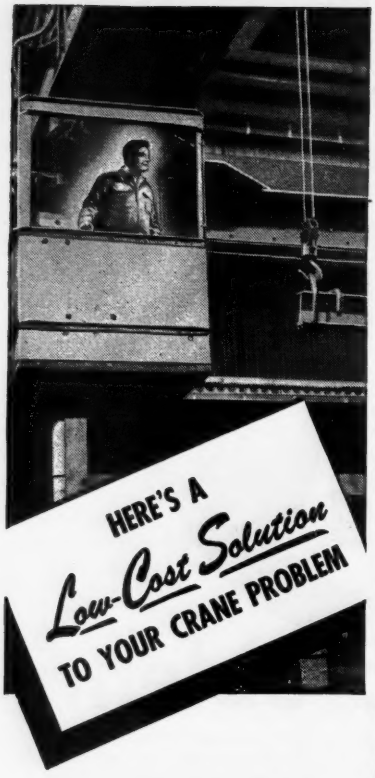


With forty years' experience in manufacturing circular rolled and welded steel parts for industry, Cleve-Weld engineers specialize in solving ring problems. If your contracts call for parts utilizing stainless steel or other types of rings or bands, call on Cleve-Weld. We have the equipment, the skilled man-power and engineering to assure quick delivery with economy and accuracy of production. Write for Cleve-Weld's General Catalogue today.

AMF

CLEVELAND WELDING COMPANY
West 117th Street and Berea Road, Cleveland 7, Ohio
Subsidiary of
AMERICAN MACHINE & FOUNDRY CO.
NEW YORK

Specialists in RINGS · BANDS · WELDMENTS



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When you order a READING CRANE, our engineers offer you a choice of several interchangeable motor, trolley and hoisting units. The crane is then "tailor made" to your own job requirements.

Known as UNIT CRANE DESIGN, this unique method of crane construction gives you far greater operating efficiency. Then too, your maintenance costs are reduced because any one unit can be removed for overhauling or repair without dismantling any other unit.

See your nearest distributor for more information on how READING UNIT CRANE DESIGN can give you better materials handling at less cost. And for your free copy of "The Why and How of Faster Production", drop us a line, today.

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Advertising Index

Concluded from preceding page

Foote Bros. Gear & Machine Corporation 37
Frasse, Peter A., & Co., Inc. 103

General Blasting Corporation 112
Giddings & Lewis Machine Tool Co. 14, 15
Gisholt Machine Co. 25
Goodrich, B. F., Co., The 3
Great Lakes Steel Corporation 60

Hamilton Tool Co., The 106
Heppenstall Co. 68
Horsburgh & Scott Co., The 159
Hunt, C. B., & Son, Inc. 73

Inland Steel Co. 46
Iron & Steel Products, Inc. 165

Jandru Steel Corp. 165

Kenilworth Steel Co., The 67
Kold-Hold Mfg. Co., Plateceil Division 127

Lake Erie Engineering Corp. 98, 99
Lee, K. O., Co. 158
Lepel High Frequency Laboratories, Inc. 32
Lewis Foundry & Machine Division of Blaw-Knox Co. 132, 133
Link-Belt Co. 23
Luria Brothers & Co., Inc. 149

Mathews Conveyor Co. 163
Mettler Machine Tool, Inc. 121

National Carbon Co., A Division of Union Carbide & Carbon Corporation 95
National Steel Corporation 60
National Tube Division, United States Steel Co. 17, 20, 21
New Britain Machine Co., The, The New Britain Gridley Machine Division 63
Nicholson File Co. 105

Ohio Crankshaft Co., The 35
Ohio Locomotive Crane Co., The 158
Ottawa Steel Products, Inc. 161

Phillips Petroleum Co. 2
Pittsburgh Lectromelt Furnace Corp. 27
Pittsburgh Steel Co. 56

Reading Crane & Hoist Corporation 168
Reed Engineering Co. 158
Reliance Steel Division, Detroit Steel Corporation 42
Republic Steel Corporation 126
Revere Copper & Brass, Inc. 85
Rockford Products Co., Inc. 16
Ryerson, Joseph T., & Son, Inc. 45

St. Joseph Structural Steel Co. 164
Scharer, Ray A., & Co. 162
Security Locknut Corporation 131
Shalland Corp. 164
Sharon Steel Corporation 64
Shimer, Samuel J., & Sons, Inc. 162
Standard Oil Co. (Indiana) 116, 117
Standard Steel Works Division, Baldwin-Lima-Hamilton 110, 111
Summerill Tubing Co. Division, Columbia Steel & Shafting Co. 130
Sun Oil Co. 71

Tennessee Coal & Iron Division, United States Steel Co. 17, 20, 21, 22
Thomas Machine Manufacturing Co. 96
Timken Roller Bearing Co., The, Steel & Tube Division ..... Back Cover
Torrington Manufacturing Co., The 10

Union Carbide & Carbon Corporation, National Carbon Co. 95
Union Wire Rope Corporation 92, 93
United Engineering & Foundry Co. 125
United States Drill Head Co. 128
United States Steel Export Co. 17, 20, 21, 22
United States Steel Co. 17, 18, 19, 20, 21, 22, 114
United States Steel Corp., Subsidiaries 17, 18, 19, 20, 21, 22, 114
United States Steel Supply Division, United States Steel Co. 17, 20, 21, 22, 114

Vanadium Corporation of America 107, 108
Van Norman Co. 8, 9

Ward Steel Co. 161
Washburn Wire Co. 34
Webb Corp., The 165
Westinghouse Electric Corporation 28, 119
Wheland Co., The 16
Williams-White & Co. 155

Yoder Co., The 36

~ ~ ~

Table of Contents, Page 5

Classified Advertising Pages 164, 165

... 168
... 158
ora-
... 42
... 126
... 85
... 16
... 45

... 164
... 162
... 131
... 164
... 64
... 162
16, 117
na-
10, 111
bia
... 130
... 71

tes
21, 22
... 96
ube
k Cover
... 10

nal
... 95
92, 93
... 125
... 128
21, 22
...
2, 114
...
2, 114
ed
2, 114

7, 108
... 8, 9

... 161
... 34
... 165
8, 119
... 16
... 155

36

EL